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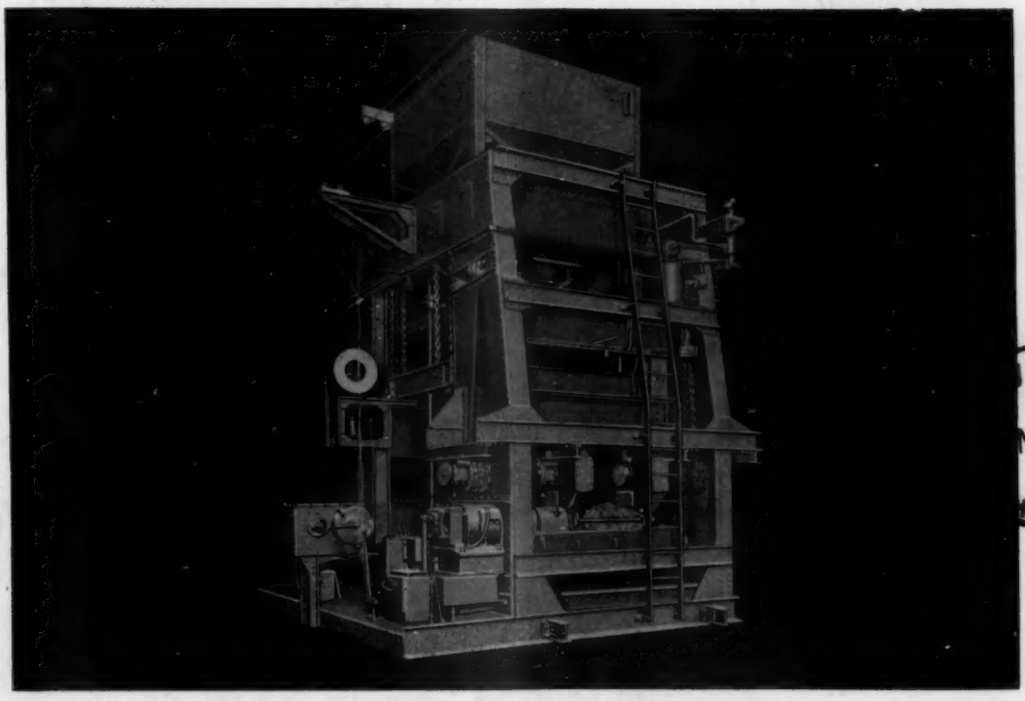

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# Koppers Small Gas Oven Plant at Battle Creek, Mich.

The Koppers Company has received a contract from the Battle Creek Gas Company, Battle Creek, Michigan, covering the erection of a coal gas plant to consist of eleven by-product gas ovens of Koppers new design and one Koppers gas producer, equipped with waste heat boiler. The ovens will be 13½" wide and have a capacity of approximately 6¾ tons per charge. Based on a coking speed of twelve hours, the plant will have a capacity of 1,500,000 cu. ft. of gas per day when heated with producer gas.

The producer will utilize the breeze and small coke to produce the necessary gas for oven heating, releasing all of the coal gas for distribution.

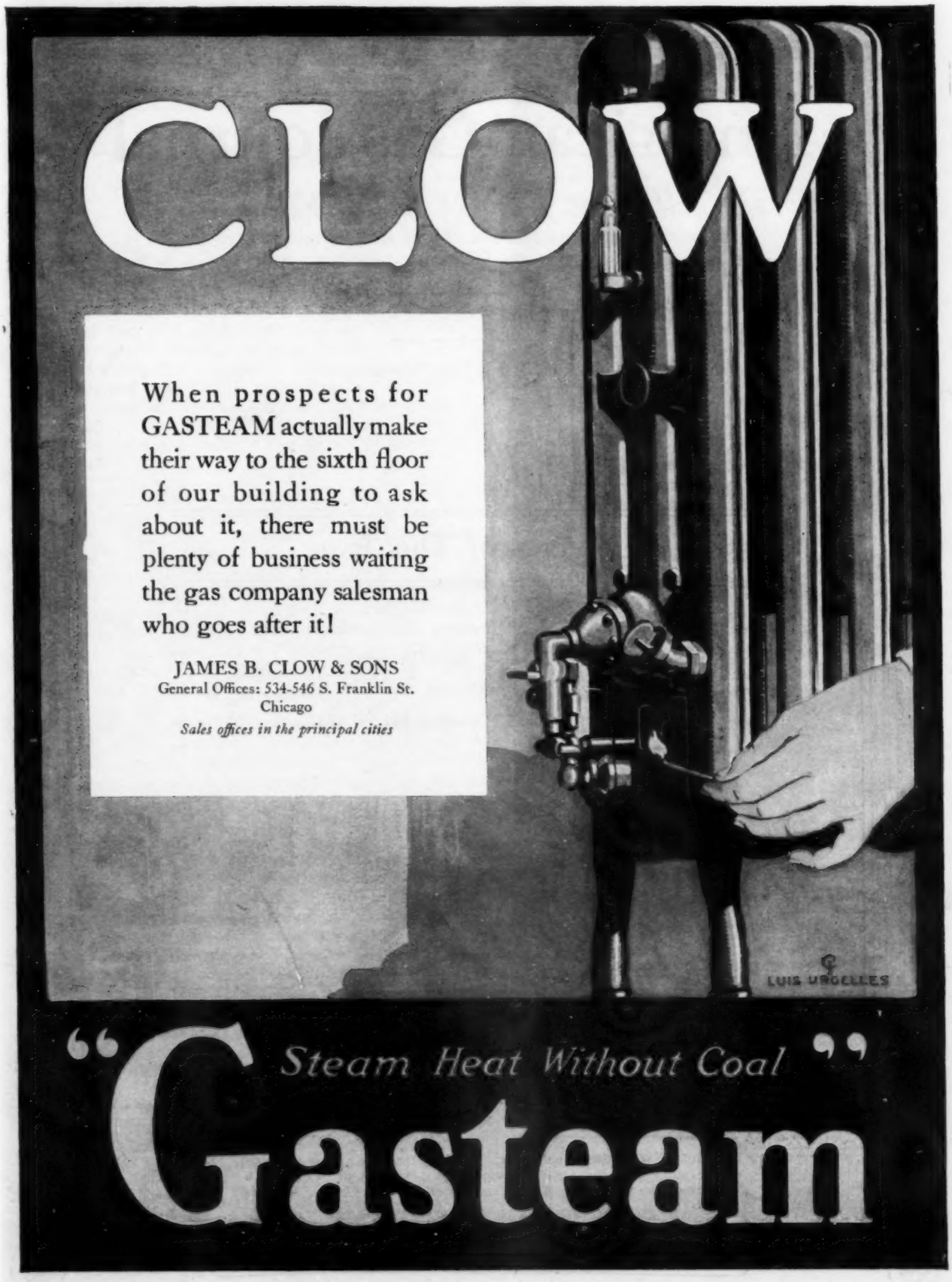
Provision has been made for instantly changing the heating of individual ovens or the entire plant from producer gas to coke oven gas, insuring the greatest possible flexibility.

This is the first practical application of the by-product gas oven to the production of gas on such a limited scale. Embracing as it does the well-known efficiency and economy of Koppers by-product oven operation, there is every reason to believe that its successful operation will mark the beginning of a new era in coal gas manufacture in this country.

The design of these ovens is exactly the same as the new type Koppers ovens which have given such phenomenal results at the plant of the Chicago By-Product Coke Company and embodies only such changes in size necessary to adapt it to the smaller capacity and give to it a flexibility which is probably unequalled in any previous coal gas installation.

## *The* KOPPERS COMPANY

**PITTSBURGH, PA.**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# American Gas Journal

*SIXTY-THIRD YEAR*

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# The Chemistry of the Coking Process

## Preparation of High Melting Point Bitumen

By Friedrich Lierg, Zeitschrift fuer angewandte Chemie, 1922, 264-268

Experiments that were made with the idea of securing better results in the coking of non-caking coals mixed with coal tar pitch, yielded the following observations and conclusions, which afford new and interesting information regarding the chemistry of the coking process and which are particularly important in apparently furnishing further substantiation of the correctness of the theory of the fusibility of coal.

### Coking with Coal Tar Pitch

When coal tar pitch is coked itself, it yields a hard molten coke. Consequently, much experimentation has been undertaken with the intention of developing a coking process wherein poor grades of coal, non-coking in nature, could be mixed with this pitch and be made to yield a product usable for metallurgical purposes. Non-caking coal requires about 20 to 30 per cent of pitch to produce a well-melted coke. The coal is ground before it is mixed with the pitch. It was then established that this favorable action on the caking of coal could be increased quite considerably, when the pitch is used in the dissolved form. If the coal tar pitch is first mixed with low melting point tar oils or other similar products, which in themselves exert no influence at all on the coking process—as they are driven out of the coking mixture before the coking process commences—there is obtained a solution of correct viscosity and quality to produce the desired results. About 7 to 9 per cent of this pitch mixture is sufficient to convert the same non-caking coal into a very high grade coke, all other conditions of the coking process remaining the same.

The action of the pitch mixture does not depend entirely on the very economical manner of its use in the dissolved condition, whereby the most uniform distribution of the pitch over the surface of the coal particles is secured, as when the solvent is changed or other properties of the solution are altered, a marked difference in the potency of the pitch solution for this purpose is observed. The mechanical effect of the pitch solution is apparently of considerable importance. The pitch solution acts as a sort of adhesive and binds together in the closest possible union the various particles of coal. In the course of the coking process, as the tar becomes thicker due to the evaporation of the solvent and as it is changed into a pitch, the union between the coal particles becomes even closer. Whatever interstices in the coal mixture still remain open are now easily filled up with the pitchy mass and when the latter is converted into coke carbon in the coking process, these spaces are permanently bridged over and the coke produced is of a single mass.

### Application to Poor Grade Coals

It was observed that only a very small amount of this pitchy mixture is required to give very good results in the coking of ordinary coals, and consequently it appeared advisable to attempt to produce good coke from very low grade coal, which was non-caking altogether. The economy of the process seemed to recommend it for extensive application. The experiments, which are described below, were carried out with a non-caking cannel coke. A coke oven was used for the purpose, two crucibles being inserted therein. These crucibles were filled simultaneously with 2 kilograms each of the straight coal and the coal mixed with the pitch solution. The results indicated without a doubt that the solution of pitch was able to produce a good coke from this coal. Then an experiment was made by filling the entire coke oven with similarly treated coal, but in this case the favorable action of the pitch addition was not apparent at all.

### Temperature in the Coke Oven

Naturally the first reason advanced for this failure to secure a good coke on a large scale test was that the temperature in the coke oven was perhaps different than that in the small experiment. But this was not so, as care was taken to see that the final temperature reached in each case, was practically identical. There is, however, a good reason for this discrepancy in the results, and that is the rate of temperature rise. In the small test the maximum temperature was reached within two hours after the operation of coking had commenced, while in the large scale test this took about 36 hours. The conclusion must, therefore, be drawn that the pitch, which is used for this purpose, possesses still too low a melting point for use in the process where the rise in temperature is so gradual. Before the proper temperature of coking is attained, most of this low melting point pitch has already been burnt off and hence has no action on the process at the most de-

sirable stage. If this conception is correct, then the coking action of the pitch must increase in potency as the melting point of the latter is increased. Then to be sure, it will be at a maximum when the melting point of the pitch is as near as possible to the coking temperature of the coal, that is in the neighborhood of 400 degrees C.

In order to confirm and further substantiate the assumption and theory that the melting point of the pitch has such an important influence on the coke produced from non-caking coals, it was necessary to find or make such a pitchy or bituminous mass, which possessed the desired high melting point. At the very outset it appeared that the bituminous extracts, that were obtained by cooking coal with pyridine, would fill the conditions. These extracts seemed to have all the properties that are required of bituminous materials for the production of good coke from poor coal. At any rate, these substances appeared to be well suited for experimentation, which was undertaken to give further insight into the mechanism of the coking process.

### Making the Extracts

Finely powdered coking coal was heated with the pyridine solution at as high a temperature as possible. This can be accomplished very readily by means of a Soxhlet apparatus. The coal was placed in the apparatus and the solvent was heated to the boiling point and allowed to act on the latter; superheating was prevented by the use of a small piece of clay in the boiling flask. The extraction thimbles are placed in a wide mouthed glass flask of about 250 cubic centimeters content. The flask rests on a glass triangle, which is provided with legs, so that the level of the boiling pyridine is about 2 centimeters lower than the triangle. The wide-mouthed flask is provided with a reflux condenser, so that the pyridine vapors are condensed and flow down over the thimble, full of coal. After several hours the coal has been completely leached out. When the dark red pyridine solution is diluted with water, a precipitate is formed of a brownish black substance, which can be dried to a fine, brown powder on clay. The product averages about 20.9 per cent of the total weight of the original coal. A small piece of this substance, when heated in a test-tube full of carbon dioxide gas, did not melt at all, but after long continued heating it decomposed with the evolution of considerable quantities of gas and tar, leaving behind a swollen residue.

The coke from this material, consequently, resembles that of the original coal very closely. However, when two comparative coking tests were made with this extracted material and with the original coal, both being carried out at the same time, it was seen that the former product commenced to coke sooner than the coal and that it yielded a much more swollen residue. The coke that is obtained by coking the extraction material in a crucible is not so compact as the same mass of regular coke, but it is light and frothy-like. The part of the coal, which remained behind after the extraction and did not dissolve in pyridine, was also put through the coking process. The flames, which were observed during the coking process, indicated that there was an undiminishingly large evolution of gas, but, due to the fact that a large part of the coal had been removed by the pyridine extraction, it did not exhibit any coking properties at all. The coke residue did not swell up and could be shaken out of the crucible in the powdered condition.

### Experiments with the Pyridine Extract

Certain experiments were made with the solid residue that is obtained from the pyridine extract. The extracted coal was mixed with the exact amount of the pyridine extract, corresponding to the amount extracted from the coal. The mixture was coked very carefully. The composition of the coal was now the same as it was before the pyridine extraction, but of course the structure was different. The original coking properties of the coal were not restored; the residue remained unchanged in its original pulverized condition. However, if the bituminous pyridine extract was first dissolved in a little solvent of tarry origin and then mixed with the coal, from which it was extracted, then a hard, lustrous cake of coke was produced, but there was no swelling in the same.

These phenomena are easily explained by the observation, made formerly, of the greatly increased adhesive properties of pitch and other bituminous substances in the dissolved condition. Even though the extracted material was returned to the coal in the same amount that it was present therein originally, nevertheless, due to causes which will be explained later, the former coking power of the coal was not restored. The bituminous mass swelled and coked in the mechanical mixture with the coal, as if it were present alone, and consequently its only action was that of a binding agent. In order to obtain a combination in this manner, which corresponds to the original composition of the coal, instead of adding 20 per cent of the bituminous substances, because of the slight adhesive power of these materials, it is necessary to use 40 per cent or twice as much. It is only when the bituminous substances are first dissolved in a solvent that the increased binding power is able to produce a hard, compact coal, when 20 per cent is used; but even in this case there is no swelling or tumefaction of the coal.

This product of extraction, which is apparently of very great influence on the coking of coal, seemed consequently to substantiate the correctness of the assumption that, due to the high melting point of the bituminous product, its coking action did not disappear on long continued heating. It has been shown that the substance did not melt at all, but was converted into a tumefied mass, resembling coking coal, at a temperature of about 400 degrees C.

The success of these initial experiments encouraged the undertaking of further tests to discover whether there were not other bituminous products, possessing high melting points and resistance to heat, which could be prepared from coal tar pitch. As the residue from the distillation process, conducted at high temperatures and pressures, and as a mixture of numerous compounds of high molecular weight, coal tar pitch appeared to indicate that it very likely

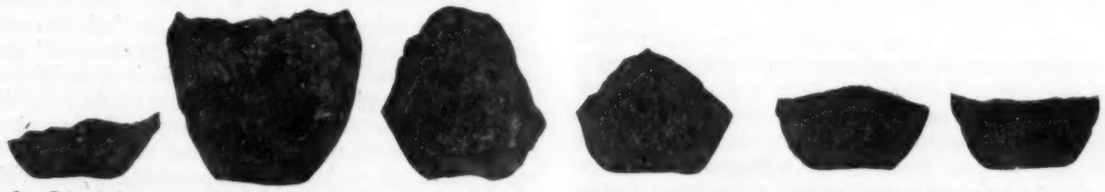
contained such high melting point bituminous products as were being sought for. On the face of it, it must have appeared rather hopeless to be able to obtain such materials by a continued distillation process, as hard pitch, which has a melting point of 85 degrees C, is produced at a temperature of 400 degrees C, which is right at the limit beyond which the distillation cannot proceed without danger of decomposition of the product.

### Obtaining the High Melting Point Material by the Wet Method

Accordingly it seemed to be much more promising to try to produce the desired material by the wet method, either by fractional precipitation or partial solution. Anthracite pitch was therefore dissolved

### Determination of the Melting Point of the Product as a Control of the Operation

The following experiments were carried out in order to determine the melting point of this fraction at least in an approximate manner and so as to be able to observe the individual stages in the melting and coking of even the smallest test samples during the entire duration of the heating. A piece of the material, the size of a grain, is placed in a test-tube, 20 centimeters long, made from high melting point glass. To the right and left of the test sample and as close as possible to it there are placed two small pieces of tin and lead. This part of the tube is then heated uniformly over a wide-tipped burner. The one end of the glass tube is closed so as to avoid the



1. Coke from two grams of hard pitch (melting point about 100 degrees C.). Coke output: 48.8 per cent. 2. Coke from one gram of difficult fusible pitch with melting point of 250 degrees C. 3. Coke from two grams of high melting point pitch (melting point about 400 degrees C.). Coke yield: 76.1 per cent. 4-6. Coke from two grams each of high melting point pitches with increasing melting point over 400 degrees C. Coke yield: 77.8 per cent, 79.9 per cent, 80.6 per cent.

7. Coke from two grams of coking coal. Coke yield: 73 per cent. 8. Coke from two grams of non-caking coal. 9. Coke from two grams of anthracite coal, sintering coal.

**SAMPLES OBTAINED FROM CRUCIBLE COKING TESTS WITH VARIOUS SORTS OF COAL AND PITCHES. TESTS WERE CARRIED OUT UNDER CORRESPONDING CONDITIONS OF TEMPERATURE, ETC.**

in a considerable excess of benzol; the residue, not soluble in this solvent and remaining as a fine precipitate, was heated with heavy benzol, and thereafter washed with benzol. When the product was dried on a porcelain evaporating dish, there was obtained a finely powdered brown powder, which, heated in the absence of air, did not become thinly liquid as ordinary coal tar pitch and melt away. After the heating was continued for quite a long time, this material, which was obtained from pitch, contracted into a ball, without wetting the walls of the vessel. This ball swelled up into a large sphere just like a soap bubble, at the point when decomposition was about to start. This is due to the viscosity and great surface tension of the tarry material. The phenomenon was just the typical tumefaction or swelling phenomenon in ordinary form. The goal, which was aimed at, namely, to secure and isolate that fraction of pitch, which had as high as possible a melting point, was accordingly attained.

entrance of a current of air. In this experiment the tin melted first at a temperature of 231 degrees C; shortly afterwards the test sample itself melted, and after some time the small piece of lead at a temperature of 335 degrees C. Evidently, then, the melting point of the pitch can be assumed to lie in the neighborhood of 250 degrees C.

In order to make the product more resistant to heat, if that is possible, it is reduced to a slime with xylol once again, heated for quite some time in a flask provided with a reflux condenser, washed with benzol and dried on porcelain. In the heating this material did not melt at all, but remained apparently unchanged in the powder form after some evolution of tar and gas. However, if a piece of the crust of this product, which is formed during the drying process, is heated in the test tube, then it swells up, as the small kernel begins to melt, forming a coke-like mass at a temperature of about 300 degrees C. A true melting of the pitch was not observed in this

case; only a slight contraction and a fugitive lustre, which the dull surface of the material assumed shortly before the tumefaction took place. Melting of the material, as happened in the former case, did not take place at all.

### Comparison of the Material with Coke

For the sake of comparison a sample of this material was heated alongside a piece of coking coal of equal size; the former had swelled up and was converted into coke in the time that it took for the coking coal just to increase slowly and with difficulty to twice its former size. Experiments were then instituted to obtain a pitch by further treatment with solvents, which would perhaps be able to show this swelling phenomenon for the first time at still a higher temperature. To this end the pitch product, which had already been obtained, was again carefully treated with light oil and thereafter washed as in the former experiments, which have been described above. A sample of the product, obtained in this manner, was heated in the melting tube. This sample was in the form of an adherent mass, and it remained completely unchanged, even when heated to a red incandescence. Accordingly it appeared as if the pure pitch carbon had been obtained, which Donath and Ariel showed could be produced from hard pitch with a yield of about 29 per cent, by extraction processes. All the products, which had been isolated up to this point, were then apparently only different degrees of purity of this pitch carbon, combined with more or less adherent pitch residues, and their difficult fusibility was only apparent, being produced by the preponderant admixture of the non-fusible, poor heat conducting elementary carbon. We shall see later whether this hypothesis is true.

### Quantitative Test in a Crucible

In order to obtain further data on this matter, the pitch carbon, which was obtained in the last test, was subjected to a quantitative coking test in a crucible in order to determine it as pure carbon by means of its unchanged weight after being heated to incandescence. The considerable evolution of gas, which was observed in the first place, appeared to confirm nothing else but the presence of pure carbon, and there was finally obtained as the product of this coking, very likely because of the greater concentration of heat in the closed crucible, a well liquefied, strongly tumefied coke, which was quite unexpected. This coke resembled in every respect that produced in crucibles from a coking coal, in the degree of the tumefaction and the structure of the porous canals, etc. At the same time the attainment of a melting temperature in this pitch product, which corresponded to that of the coking temperature of coking coal, that is, a temperature of 400 degrees C, was realized.

After this fact had been established the treatment of pitch products with solvents was carried on further. The experiments led to the production of still higher melting point products, which yielded forms of coke, which were exactly similar in every respect to the products manufactured from lean coal, non-caking coal and sand coal.

A number of coking tests were made with various coals, mixed with different pitch products. In each experiment about 2 grams of the material were used.

The behavior of these pitchy products in the treatment with solvents furnishes an insight into their composition. The stronger the solvent action of the solvent, with which the pitchy residues are treated, the higher the temperature at which the isolated pitchy product shows signs of swelling and the more the product resembles that obtained from lean coal, non-caking coal or sand coal.

The degree of the activity of the solvent is determined by the specific gravity of the same in the first place, and then naturally by the amount of it that is used and the temperature at which it is allowed to exert its solvent action. Inasmuch as its solvent powers are much stronger at an elevated temperature, hence when the solution is cooled thereafter, a certain part of the dissolved substance will precipitate from the solution as a black precipitate. A tumefaction and melting test was made on this precipitate, and in each and every case, it was observed that both swelling of the mass and fusion thereof took place at a lower temperature than with the part that did not go into solution when the original substance was treated with the solvent.

From all this information that has been made available on the character of this pitchy product, it may easily be concluded that, what was generally considered up to the present time to be pitch carbon, and a pure elementary carbon at that, is nothing more than a homogeneous mixture of very high molecular organic compounds. The solubility of these compounds increases in difficulty and their melting points undergo a similar increase as their molecular weights increase. In other words, the higher the molecular weight, the more difficult of solution and fusion they become, in common with other series of homologous organic compounds.

### Similarity Between These Pitchy Bodies and Coal

In this respect these high molecular weight substances in pitch are very much like coal. In the latter case, when the formation of the coal is being considered, we must assume the presence of compounds, condensation products, of high and the highest molecular weight. Of course, as may be determined in the case of coal during the course of its decomposition, there are other kinds of organic compounds, which must be taken into consideration as well, but in spite of this, there is quite a remarkable agreement between the two substances, that is both pitch and coal, in regard to the difficulty of bringing them into solution, the high temperature to which they must be heated to make them melt, and in fact in their entire behavior during the coking process.

### Coke from Pitch and Coke from Coal

It is now quite evident that the two products, both coal and the isolated pitchy substance, will give the same kind of coke, that is coke having similar struc-

(Continued on Page 74)

# A. G. A. Seeks Vote on Place of Next Convention

The American Gas Association has forwarded a circular to its members, asking for a vote as to where the 1923 convention should be held. It will be remembered that at the 1922 convention the Time and Place Committee recommended that the next annual gathering be held in either Chicago or Atlantic City. With the notice is enclosed a postcard for easy voting. The circular reads:

To All Members of the American Gas Association:

The Time and Place Committee for our 1923 Convention reported as follows:

"The splendid growth of our association and the large, enthusiastic attendance seems to limit the selection of a suitable place for the 1923 Convention to those cities having adequate hotel and exhibition facilities.

"We have outgrown the possibility of having the hotel headquarters, exhibition and meeting halls in one building. Therefore, adequate room should be provided to meet the situation.

"Your Committee on Time and Place recognizes the geographical distribution of the membership as well as the national scope of the work to be accomplished and recommends that the 1923 Convention and Exhibition be held in the City of Chicago, or Atlantic City as an alternate, in the earlier part of October, leaving the selection to the Executive Board of the Association so that there may be no conflict with the meetings of other national utility associations."

This report was approved by our membership, but subsequently there have been received letters from both members and exhibitors who fear that Chicago's facilities at the present time will not make possible as desirable an arrangement as that which Atlantic City affords. After carefully canvassing the facilities in Chicago, it is found that the Municipal Pier is available, but there again objection is made because it is not conveniently located with respect to the hotel and central districts. This objection could undoubtedly be overcome by arranging for special transportation facilities.

Subsequent to the annual convention the Managing Committee of the Manufacturers' Section, after giving careful consideration to the report of the Time and Place Committee, unanimously recommended to the Executive Board the selection of Atlantic City as the meeting place for the 1923 Convention.

It has been the custom of the association to alternate its conventions annually between the East and West, for the association is a national one, with its membership widely distributed in all sections of the country, and it is their convenience which must be considered. Consequently, in view of the conflicting opinions which have been expressed on this subject, the Executive Board, before making a final decision, now invites the entire membership to express its preference as between Chicago and Atlantic City for the 1923 Convention and Exhibition.

Information has reached us that plans are under way for the erection of a new and modern hotel in Chicago, which, when completed, will have available space and accommodations for our entire convention and exhibition under one roof. This structure, however, will not be completed in time for our use this year; therefore, should it be decided to return to Atlantic City for the 1923 meeting, such a selection would be with the intention of holding the 1924 meeting in Chicago, and alternating regularly thereafter between the West and East.

Will you signify your choice on the enclosed postcard and mail it without delay to the Association Headquarters. As the holding of an annual convention requires completion of arrangements well in advance, it is imperative that we act promptly in this matter and the opinions expressed by the membership will greatly assist the Executive Board in making a definite decision.

Kindly mail the enclosed postcard to reach the association headquarters not later than February 7th.

AMERICAN GAS ASSOCIATION.
Oscar H. Fogg, Secretary-Manager.

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## Solving Distribution Problem at One Swoop

Albany, N. Y.—A measure introduced in the New York State Legislature last week by Mr. Antin (Senate Print No. 62), amending the labor law, provides for a new bureau of inspection under the supervision and control of the Industrial Commissioner, who may appoint not less than 225 factory inspectors and not less than 20 mercantile inspectors.

Assemblyman Male in the Lower House, under Assembly Print No. 183, introduced January 16, would solve the entire problem of gas, electricity and water supply at one fell swoop. His measure provides for the expenditure by the State of New York of the paltry sum of seven hundred million dollars for the development and transmission of hydro-electric energy, the building of water mains from the Adirondacks and Catskills to the cities and villages, and gas producing plants at central points throughout the State with pipe lines to surrounding territory. Thirty-five million dollars of the money so appropriated is to be available each year for twenty years so that the work of construction, once undertaken, need not halt until completed, and every citizen of the State shall have running water, gas and electricity in his home, supplied to him at cost. This measure is unique, not only in solving all of the public utility problems so far as gas, water and electricity is concerned, but also in being the largest appropriation measure ever introduced in the New York State Legislature.

# New York State Legislature Activities

Albany, N. Y.—Senator Lacey and Assemblyman Seelbach from Buffalo introduced a series of measures in the New York State Legislature last week calculated to give to the City of Buffalo the right to own, operate, maintain and regulate all public utilities. These measures are in sympathy with the Democratic platform and the message of Governor Smith at the opening of the Legislature. In the measures all the power and authority now vested in the Public Service Commission is transferred to the City of Buffalo, and the further authority of municipal ownership is conferred. The fate of the bills will depend upon the final policy of the Legislature towards the regulation of public utilities. At present the administration measures affecting the Public Service Commission and public utilities in New York City are still in their inception and until such measures are introduced and the Republican Assembly has had a chance to go on record regarding their passage, there can be no basis for expectation as to the fate of the Buffalo measures. It is significant, however, that the Buffalo measures have been introduced by a Democratic Senator and a Republican Assemblyman.

Some important measures introduced in the Legislature last week are:

Senate Print No. 22, by Mr. Downing, introduced in the Assembly by Mr. W. W. Campbell, Republican, of Schenectady County; represents the official bill of the State Federation of Labor and would make the state fund the exclusive agency for workmen's compensation insurance, except for municipalities which may elect to be self-insurers. The measure simply provides the law without any machinery added for its enforcement. No provision is made for an increase in the personnel of the Workmen's Compensation Bureau to take on the ninety per centum of insurance now being written outside the state fund, nor has the detail of return of securities by mutuals and self-insurers now on deposit with the insurance department been attended to. The Lockwood Committee in its final report will recommend a somewhat similar measure, which carries a provision for the return at the proper time of such securities.

Senate Print No. 30, another measure by Senator Lacey, amends the Workmen's Compensation Law by increasing period of compensation for certain permanent partial disabilities.

Senate Print No. 31, by Mr. Lacey, adds a new section 20-b, to General City Law so as to permit cities to regulate service and fix rates for certain public utilities.

Senate Print No. 32, by Mr. Lacey, amends the Transportation Corporations Law, permitting cities to operate, lease, own and maintain bus lines, stage routes or motor vehicle bus lines or to consent to their operation without certificates of convenience and necessity from Public Service Commission.

Senate Print No. 33 amends the Railroad Law by permitting legislative bodies of cities to regulate and reduce rates of fare of certain railroads operated wholly or partly in said cities.

Senate Print No. 36, by Mr. Lacey, amends the Buffalo Charter so as to authorize the city to examine books and papers of persons or corporations operating public utilities within city limits.

Senate Print No. 45, by Mr. Antin, adds new section, 217-a, Civil Practice Act, empowering cities to institute actions involving rates, fares, charges or service or issues of stock or other forms of indebtedness of public service corporations operating in whole or in part within city limits, and making, in actions not instituted by such city, the city a necessary party thereto.

Senate Print No. 47, by Mr. Lacey, adds new section, 20-c, General City Law, so as to permit any first or second class city to investigate public utilities operated wholly or in part within its boundaries to hear complaints against service, to enact ordinances affecting such utilities and to establish bureaus of public utilities and to investigate books thereof.

Assembly Print No. 18, by Mr. Hamill, would establish a minimum wage board of three members, to be appointed by the Governor, one of whom must be a woman.

Assembly Print No. 21, by Mr. Male, amends Section 25, Workmen's Compensation Law, by providing compensation shall become due on the 14th day of disability, instead of 21st, as at present, and that employer or insurance carrier in uncontroverted cases, shall on or before the 18th day after disability or within eight days after employer first has knowledge of accident, begin paying compensation. Industrial commissioner must in every case give notice of hearing before industrial board or referee to determine whether proper compensation is being paid.

## Combustion of Sawdust

The burning of sawdust for boiler purposes is best accomplished by means of a simply constructed "Dutch-oven" furnace, according to the United States Bureau of Mines. As a rule, only one feed hole in the roof of the furnace is used, for sawdust is such an excellent fuel that it will produce a hot fire even when handled roughly and carelessly. Of course, with a single feeding hole in the top of the Dutch oven, the sawdust forms a cone on the grate surface. A cone is about the least effective form in which any fuel may be arranged on a grate for burning. The draft penetrates the bed of fuel at the points of least resistance, that is, at the shallowest parts; hence the air enters at an excessive rate around the edges of the cone while the largest part of the grade is effectually air-tight and consequently is "dead." This difficulty can be reduced or eliminated by different methods, which are described in Technical Paper 279, just issued by the bureau.

# N. Y. Consolidated Gas Co. Earned $31,827,629

## Annual Report Reviews Progress During 1922

New York, N. Y.—The Consolidated Gas Company, in its report for the year ended December 31, 1922, shows surplus earnings available for dividends amounting to $21,872,798. Net earnings, before the payment of interest on the funded and unfunded debt, were $31,827,629, gross earnings $113,086,372, and operating and non-operating expenses $81,258,742. These figures are from the combined earnings statement of the Consolidated Gas Company and affiliated gas and electric companies, the first time the company has reported in this manner. For this reason no comparison was made with the preceding year. The outstanding items of the combined earnings statement and balance sheet were as follows:

EARNINGS STATEMENT

| | | |
|---|---|---|
| Gross earnings, including miscellaneous operating and non-operating revenue | | $113,086,372.25 |
| Operating and non-operating expenses, including renewals and replacements and taxes | | 81,258,742.73 |
| Net earnings | | $31,827,629.52 |
| Interest on funded and unfunded debt | | 9,954,831.21 |
| Surplus earnings | | $21,872,798.31 |
| Dividends paid: | | |
| On Consolidated Company's stock | $8,525,597 | |
| On affiliated company's stock | 37,003 | |
| | | 8,562,600.00 |
| Balance carried to surplus account | | $13,310,198.31 |

COMBINED BALANCE SHEET.

ASSETS.

| | | |
|---|---|---|
| Plant and equipment (including land) | | $460,342,880.79 |
| Investments | | 6,505,753.39 |
| Cash | | 13,816,273.93 |
| Accounts receivable | | 18,877,921.14 |
| Materials and supplies | | 13,249,439.67 |
| Total | | $512,792,268.92 |

LIABILITIES

| | | |
|---|---|---|
| Capital stock outstanding: | | |
| Consolidated Gas Company | $135,372,120 | |
| Affiliated companies | 998,350 | |
| | | $136,370,470.00 |
| Funded debt | | 120,492,432.50 |
| Unfunded debt | | 46,489,877.18 |
| Accounts payable & accrued charges | | 14,866,793.06 |
| Reserve for renewals and replacements and insurance | | 11,931,575.64 |
| Reserve for contingencies | | 55,016,202.26 |
| Stock and bond premiums | | 38,085,397.04 |
| Surplus | | 89,539,521.24 |
| Total | | $512,792,268.92 |

Commenting on the 1922 operations of the company, President George B. Cortelyou said:

"It will be observed from the combined balance sheet that the total amount of the capital stock of the affiliated companies in the hands of the public amounts to only $998,350, which is equal to only a fraction of one per cent of the amount of outstanding capital stock of the Consolidated Gas Company.

"It will also be noted that although the net earnings for the year 1922 amounted to but 6.2 per cent on the total investment, the surplus earnings remaining after the payment of all fixed charges amounted to a substantially higher rate on the outstanding capital stock.

"The unfunded debt, amounting to $46,489,877.18, will be canceled to the extent of $29,627,880 with the proceeds remaining to be paid, of the sale of $25,000,000 of common stock having no nominal or par value and the proceeds of the sale to consumers and employees of $15,000,000 of 6 per cent cumulative participating preferred stock.

"Assuming this to have been completely effected as of December 31, 1922, the resources from which the assets representing the combined investment would have been derived, would have included but $153,352,779.68 of interest-bearing obligations and preferred and minority stock. The balance of $359,439,489.24 would be made up of the proceeds of stock issues, the premiums on same, the surplus and reserves, and the non-interest-bearing obligations representing the employment of the company's credit in the creation of assets, which, for any purpose of calculating the return which has been earned, must, of course, be included in the total investment. In other words, the equity of the non-par value common stock in the 1922 earnings is represented by an investment of $119.81 per share, as against the investment representing the debt and the preferred and minority stock equal only to the par value thereof, besides which any earnings on the investment representing the debt and the preferred and minority stock in excess of the interest and dividends thereon, belongs to the common stock, subject to the participation rights of the preferred stock.

"It follows, therefore, that seven per cent earned on the investment per share of non-par value common stock would amount to over $8 per share.

"It is estimated that the reproduction of these properties would involve the expenditure of at least $750,000,000, upon which amount the 1922 net earnings yielded a return of but 4.2 per cent. If this basis were taken for rate purposes, as many courts have held should be done, the investment per share of non-par value common stock would amount to

approximately $198.88 per share, seven per cent on which would be equal to $13.92 per share.

"The combined balance sheet, which shows the actual investment in these properties, indicates the strength and stability of the Consolidated Company's financial condition. The financial structure shown by this balance sheet is unique. It is due not only to the fact that much of this company's capital stock was issued, in earlier years, at a substantial premium, but also to the conservative policy which for many years has governed the matter of dividend distribution as well as the accumulation, out of earnings which were within the limits of a reasonable return on investment, of substantial but prudent reserves as safeguards against uninsurable hazards and vicissitudes. The investment of these resources in gas and electric properties gives assurance of the Company's ability to maintain at least its present earning capacity. At no period in its history has this company been in a better position to maintain the rights and interests of its many investors against assault from any quarter.

### The Decision of the United States Supreme Court

"The year just ended will always be remembered as one of the most important in the history of this company, in that it witnessed a final and unanimous decision in the company's favor, at the hands of the nation's great court, thereby bringing to a close a long and vigorously contested litigation. The decision rendered by the United States Supreme Court on March 6, 1922, was more than an ultimate adjudication of the confiscatory character of the 80-cent gas rate. The opinion of the Court was an authoritative and controlling adjudication as to many matters which pertain vitally to the affairs of this company, the integrity of the investments in its properties, and its ability to render acceptable service to its many consumers and pay a fair return to its thousands of stockholders, notwithstanding any manner of attack for political or personal propaganda. Probably no case in the recent history of the Supreme Court has been as closely watched by investors, executive and public officials, in all parts of the country; and the Supreme Court's unanimous vindication of the course taken by this company has done much for the stability of the public service enterprises throughout the United States.

"The defense of this case by the municipal and other public authorities represented the most formidable effort ever made to use the money of taxpayers and the energies of public officials without stint, to render the constitutional guaranties inapplicable and ineffectual to vouchsafe fair treatment to investors in utility enterprises. The action of the Supreme Court was a decisive repudiation of this effort, its purposes and its methods. The often-urged contention that the prosperity and earnings of this company in earlier years would warrant the court in requiring the company 'to operate indefinitely at a loss' was emphatically repudiated by the court. 'Mere past success could not support a demand for the continuance of a rate which had become inadequate. 'The presumption is that any profits from its gas business were lawfully acquired.'

"Reference to the favorable outcome of this important litigation should hardly be closed in this report without bringing again to mind the fact that, due to the absence then of a state tribunal with power to prescribe adequate rates for gas and due even more directly to the unfair, dilatory and obstructive tactics of the municipal representatives, so unsparingly condemned by the Supreme Court, the establishment of the obvious fact of the inadequacy of the 80-cent gas rate cost these companies many hundreds of thousands of dollars of direct outlay, as well as an incalculable amount of the time and energies of officers and employees, all of which might better have been devoted to the business of the company in serving its consumers. All of this staggering burden of avoidable expense has had to be borne by the consumers of the company, in the rates which they pay; but the responsibility is upon those public officers who employed such measures of unfairness, not upon those who struggled against them. In addition to this great burden put upon the people of this city as consumers of gas, there must be taken into account the expenditure of probably at least a million dollars more, of moneys raised by direct taxation, by the municipal and other public officials who were exploiting this litigation for political purposes. Much more than a million dollars have thus been worse than wasted, and the taxpayers and gas consumers burdened accordingly, incident to the bringing about of a just, reasonable and necessary result, which it should have been possible to secure with celerity and little outlay, through the determination of an impartial state tribunal, charged with the constant duty of raising rates whenever imperative and of reducing them when conditions changed.

### The Adoption of a Thermal Standard for Gas

"Hearings were continued before the Commission during 1922 on the subject of adopting, for New York City, a modern thermal unit standard for measuring the quality of gas, in place of the obsolete and costly 22-candlepower standard which had long since been discarded throughout the rest of the United States and the world. Engineering representatives of the commissions of other states, municipalities and gas companies were summoned to the stand by the Commission, and the most expert and thorough canvass of the subject was secured that had ever taken place before any tribunal.

"The practically unanimous opinion was, of course, that such a change for the benefit of consumers in the foremost city of the world should not be longer delayed.

"On August 30, 1922, the Commission adopted an order which prescribed for gas companies operating in the City of New York a monthly average standard of not less than 537 British thermal units per cubic foot of gas with a prohibition against a daily average of less than 525 British thermal units for any three consecutive days in any month. This order became effective on October 1, 1922. In order to insure that gas measured by the new standard of quality would

give the best possible service to all consumers, this company has expended many thousands of dollars, unprovided for by the rates contemporaneously fixed, in inspecting and adjusting all appliances in which gas of the former candlepower standard had been used.

"The results from the change of standard thus far have undoubtedly been a more economical and efficient use of gas throughout the territory of this company and its affiliated gas companies. At the same time, every consumer has been given the full benefit of the resultant economies in the cost of manufacturing gas, through a reduction in rate, on this account alone, of five cents per thousand cubic feet of gas used.

**Reductions Aggregating $3,177,727.30 in Gas Rates**

"The investigation instituted by the Public Service Commission in 1921, as to the rates charged for gas by this company and its affiliated gas companies within the City of New York, continued during the first seven months of 1922. Numerous hearings were held as to the rates of each of the companies; and the preparation and submission were required of a great quantity of statistical data relating to the operating costs and properties of the respective companies and of the system as a whole. A thorough analysis of this data was undertaken by the engineering and accounting staffs of the Commission, including a great deal of checking and verification of the same by examination of the company's accounts and underlying records.

"When this work neared completion, the Commission notified the companies and the representatives of the City of New York that it had reached the conclusion that a great deal of time and expense, which otherwise would be occupied in protracted formal hearings, might be obviated if an effort were made to deal with the matter through informal public conferences, at which representatives of the companies and of the municipalities could be present and give aid to the Commission in developing the pertinent facts. The Commission pointed out that, if reductions had become possible in the rates charged for gas by all or by some of the companies concerned, a way ought to be devised of bringing about such reductions at the earliest possible moment, without awaiting the protracted processes of formal hearing.

"When the conference called by the Commission was convened, the representatives of the City of New York refused to take part in anything which promised so quickly to bring about a termination of the matter through reductions in rates, instead of its prolongation as an opportunity for political harangue and misrepresentation. The conferences nevertheless proceeded, but soon developed the fact that the Commission sought a reduction in the rates below the point permitted by operating costs at that time and a continuance of the rate of return upon investment which has been held by the courts to be the constitutional right of the company. The points at issue between the Commission and its staff and the representatives of the company were expeditiously and clearly developed in the conferences, but the representatives of the Company were unable to accept reductions to the extent suggested in the conferences.

"On August 30, 1922, the Commission unanimously adopted an opinion and a series of orders which prescribed rates to be charged for gas for a period of one year, generally dating from October 1, 1922, for every gas company in New York City. As to this company and its affiliated gas companies, the rates prescribed by these orders were in every instance a reduction.

"The opinion of the Commission also gave frank recognition, in the form of definite findings, to the right of the companies to have their rates such as to yield a return upon at least the amount of the actual investment in their useful gas properties, and the Commission determined this investment as of July 31, 1922, to be $154,825,011.97.

"As to the action of the Commission, it may be stated that the revenues of this Company and its affiliated gas companies, under the reduced rates fixed by these orders, will be at least $3,177,727.00 less than they would have been during the prescribed period, if the same quantity of gas sold had been billed at the rates in force at the time the Commission's order was made.

**Deficiency in Gas Earnings Since 1917**

"By the time the rate cases were decided in the United States Supreme Court, the deficiency in the earnings of the Consolidated Company and its affiliated gas companies, from 1917 to the time of the decision, below the cost of gas including a return of eight per cent upon their investments in their gas properties, due to the inadequacy of the eighty-cent rate, aggregated, when compounded, $78,784,903.88. Deducting from this sum the total amount of revenue derived from rates charged under injunctions in excess of the statutory rate, and segregated from earnings pending the determination of the appeal of the defendants in the rate proceedings to the United States Supreme Court, $23,496,646.89, leaves a net deficiency in the earnings of these companies of $55,288,256.99, which, it is our contention, must in justice be given consideration in determining the reasonableness of rates to be charged by them for gas.

**Rates of Pay for Labor and Prices Paid for Materials**

"The hope expressed in the annual report a year ago, of a substantial lowering in the prices necessarily paid for materials and labor entering into the cost of manufacturing and distributing gas has not in fact been realized in the present conditions or in those immediately ahead. During the past twelve months, prices of many essential commodities of the industry have reached levels even higher than a year ago, so that the current prices of most materials entering into the cost of gas are still more than double pre-war levels.

"Coal, gas-oil and labor constitute the principal items entering into the cost of manufacturing and distributing gas. The pre-war price level of these and other essential commodities, together with the prices as of January 1st, 1922, and of January 1st, 1923, are shown in the following table:

| | Pre-War Prices | Prices Jan. 1, 1922 | Prices Jan. 1, 1923 |
|---|---|---|---|
| Anthracite, per ton ..... | $4.67 | $10.73 | $10.60 |
| Bituminous Coal— | | | |
| Domestic, per ton ..... | 3.30 | 7.51 | 7.63 |
| Foreign, per ton ..... | .... | .... | 8.50 |
| Gas-Oil, 1915, per gal. ... | .03 | .06 | .0552 |
| Wrought Iron Pipe, per ton ..... | 52.50 | 124.00 | 160.00 |
| Steel Pipe, per ton ..... | 37.50 | 60.00 | 80.00 |
| Wood Shavings, per bale. | .26 | .465 | .39 |
| Malleable Iron Fittings, per ton ..... | 120.00 | 197.00 | 195.52 |
| Cast Iron Pipe, per ton ... | 21.50 | 46.50 | 56.10 |
| Cast Iron Special Castings, per ton ..... | 53.00 | 110.00 | 112.00 |
| Fireclay Shapes, per ton.. | 12.00 | 25.00 | 28.00 |
| Fire Brick, per M ..... | 21.00 | 50.00 | 60.00 |
| Checkerbrick, per M .... | 23.00 | 50.00 | 56.40 |
| Lumber, per M ft. ..... | 32.50 | 57.50 | 57.50 |
| Red Building Brick, per M pcs. ..... | 7.00 | 17.00 | 18.50 |

"The average rate of wages paid hourly employees in the various gas departments today still remains as it was a year ago, 105 per cent greater than it was in 1913 and 80 per cent higher than it was in 1916. It is 164 per cent higher than it was in 1906, when the 80 per cent rate was enacted by the Legislature, which was subsequently (1909) sustained by the United States Supreme Court, but was found confiscatory, and therefore invalid, by the same Court, in the decision rendered on March 6, 1922, which is elsewhere referred to.

"The cost of steam coal used extensively in the production of electric energy is approximately 12 per cent higher than it was a year ago. Fabricated products required for the maintenance of the electric generating plants and distribution systems cost 10 per cent more than they did on January 1, 1922.

### Coal Shortage

"In the Winter of 1921-1922, all indications pointed to a probable strike of coal miners on April 1, 1922. It was anticipated by the officers that it might be difficult to obtain contract coal, and accordingly steps were taken to accumulate gas-coal for our coal-gas plants and anthracite for our water-gas plants.

"On April 1, no contracts for anthracite were obtainable and, with one exception, no contracts could be made for gas-coal, as the future conditions in the coal market were so uncertain that none of the coal companies, with which the company has had business relations for many years, felt themselves in a position to make contracts. The officers were, therefore, obliged to purchase such coal as was available in the open market.

"It became apparent that the supply of domestic coal would have to be supplemented by the purchase of foreign coal. Total deliveries of foreign coal have amounted to more than 100,000 tons.

"It became evident during the summer that a serious shortage in the supply of coal for domestic and commercial purposes in the City of New York, in the Winter of 1922-1923, was inevitable. In August or September the Governor of the State appointed a Fuel Administrator to look after the State's interests in the matter of the allotment of coal by the Federal authorities and its distribution to the public. In September, the Consolidated Gas Company, and its affiliated gas companies, issued a notice to every consumer, inviting attention to the threatened coal shortage and urging the greatest possible economies in the use of gas, in order that the company might conserve its coal supply, so as to be able to meet the demand for gas in the winter, for house-heating purposes. In December, the company established coke delivery stations in various parts of the city, where the public could obtain coke by the bushel for domestic use at a nominal price. Considerable publicity was given to this circumstance by the Fuel Administrator, who urged the public to avail themselves of this facility for supplementing the inadequate supply of domestic coal coming into the market. It was apprehended by the company that the demand for gas for house heating might become so great as to tax the gas manufacturing plants beyond their capacity. Fortunately, the winter, thus far, has not been severe, the coldest periods having generally occurred late at night or very early in the morning. The increase in output of gas over the prior year has not, therefore, been very considerable. The increase in October, 1922, over October, 1921, amounted to 4.32 per cent; in November, it amounted to 8.24 per cent, although the maximum day in November, 1922, exceeded the maximum day in November, 1921, 13.36 per cent. The December, 1922, output exceeded that of December, 1921, 9.71 per cent.

### Gross Capital Expenditures

"The aggregate capital expenditures of the Consolidated and its affiliated gas and electric companies, for the year 1922 were $33,875,833.27, of which $26,742,893.56 was for electric property and $7,132,939.71 for gas property. It is estimated that in the year 1923 it will be necessary to expend for additions and extensions to the gas and electric manufacturing and distributing systems approximately forty-four million dollars.

### Statistical

"The municipal street lamps on the lines of the Consolidated Gas Company and its allied gas and electric companies on December 31, 1922, consisted of 6,217 incandescent gas lamps, 429 electric arc lamps and 66,709 electric incandescent lamps, a total of 73,355 street lamps.

"The total number of gas meters supplied by the Consolidated Company and its affiliated companies in use at the end of 1921 was 1,018,388 and of electric meters 617,382.

"The gas sales of the Consolidated Gas Company increased during 1922, as compared with the previous year, 534,839,900 cubic feet, or 2.67 per cent. In 1921, there was a decrease in gas sales of 6.54 per cent, as compared with the previous year.

"Its gas sales and those of its allied gas companies in the Borough of Manhattan, increased during the year 647,508,400 cubic feet, or 2.40 per cent, as compared with a decrease of 6.05 per cent in 1921.

"In the Borough of The Bronx, the increase during 1922 in the volume of sales amounted to 157,192,100 cubic feet, or 2.95 per cent, as compared with a decrease of 2.64 per cent in 1921 below the previous year.

(Continued on page 77)

# As the Journal Views It

## Precautionary Measures

The following editorial submitted by one of our readers is self-explanatory. We would like to hear from other of our readers on this subject.

A recent editorial in the American Gas Journal, captioned: "Meet This False Propaganda," was timely and conveys some worth while truths. Whether or not some of these "gas accidents" are deliberately, carelessly or ignorantly reported makes but little difference as far as our motive is concerned, unless we can get a plain case of deliberate falsification with intent to injure the gas business and then we can apply the screws, but as we think most of the reports are due to pure guesswork by some cub reporters, we will have to tackle the case at once, secure the co-operation of gas consumers, city editors of newspapers and then stop a large part, if not all, of these false reports.

Let's have an idea how to do it!

On the gas bill, rendered ever so often, let it be printed in bold type: "If there is any gas leakage about your premises, report the matter to our office at once. We will be glad to correct the fault without any charge to you. This is very important to you and to us."

In our newspaper advertisements we can use these words of caution, and occasionally vary our advertisement, something like this:

"Never hunt for a gas leak with a flame.

"You wouldn't hunt for a gasoline leak with a match.

"Why use a match when looking for a Gas Leak?

"Let the Gas Company hunt the leak. It costs you nothing."

Running these advertisements will keep the people fully aware of the necessity of reporting leaks to headquarters, and then the big boss of the newspaper can say to the pencil pushers:

"I want no more guesswork. There must be nothing but established facts when reporting explosions, fires, etc. If the cause is unknown say so, but do not attribute all explosions in homes as due to gas. There is a vast difference between gas and gasoline, and there are few homes that do not use gasoline for some purpose. Gas explosions are rare as compared to the number of explosions charged to it. News unless it is true is worthless to me."

The little speech made by the City Editor is the way all first-class newspaper men feel about such things, and it is up to us to remind them that we expect their co-operation. I cannot help but feel that it is poor reporting that begets the news twisted, and it's up to ourselves to prevent the twist, several methods suggested. There are other ways and means, therefore let's hear 'em.

## N. Y. Consolidated Annual Report

The report of the Consolidated Gas Company of New York, which is published in this issue, shows that while the gas industry is making splendid progress, it is not yet out of the woods. The analysis of costs entering into the operation of a company, as contained in the report, is the best answer that we know of, to those who are asserting that the industry should be able to go back to a pre-war basis. The cost of labor and material, as shown in the report of George B. Cortelyou, is still high, and, as pointed out, there is little likelihood of any reduction in the immediate future.

The annual report also contains a direct answer to the critics of that efficiently operated company, by showing conclusively that it has always been operating with the desire to render the most satisfactory service to its customers. It shows that much of the burden that the customers are asked to assume is due to the tactics of elected officials who are animated by a desire to gain their own political ends regardless of the cost to the public.

The report with its balance sheets is one of the most complete that any company has issued, and it is bound to appeal to the average citizen, who will find much food for thought in its statements.

That the company has been able to prosper despite the venomous attacks to which it has been subjected is a splendid tribute to the efficiency of the management. We recommend that all gas company men read the report carefully.

## The Chemistry of the Coking Process

(Continued from Page 66)

tural characteristics, when the two substances possess the same melting point. Consequently, the hypothesis which was advanced by Muck, and which affirms that the coking of coal is essentially a melting process, and that the degree of swelling of the different kinds of coal depends on the extent to which the coal softens, and also, corresponding thereto, the manner in which the decomposition gases are driven through the softened mass, that is, the violence with which this action takes place. This hypothesis is therefore substantiated and proven to be positively authentic.

### Analysis of the Coking Process

What has proceeded has shown that it is possible to isolate an entire series of products from coal tar pitch, which have increasing melting points, by systematic treatment with solvents. It has also been shown that it is possible to obtain all sorts and degrees of pasty softening in the products in a gradual transition from the thinly viscous to the thickly viscous state and at the same time to secure the tumefaction phenomenon, which is caused by the decomposition, in all degrees of intensity, so that the coke formation that is obtained corresponds to the degree of softening that takes place in the mass of coal and pitch in the crucible. From these facts it is possible to analyze the phenomenon of coking into its several separate and individual phases, and it is also possible to visualize the positive connection that exists between the usual melting or softening of the coal and the coking process, although the melting or softening phase of the operation, that is, of the coking of coal, does not appear so obvious at first glance.

On the other hand, this softening or melting of the coal in the coking process does not appear to be an intermediate, incomprehensible condition at all, although the tendency is to call it so at first observation. For example, a piece of coal the size of a pea, which is heated in the melting tube, described above, can be pressed together by means of two glass rods, which are introduced into the tube, one on each side of the coal sample, and which are quickly moved together, at the proper moment when the coal begins to expand. In this manner it is possible to squeeze the coal together so that it is flattened out in a thin sheet about the thickness of paper. This trick can be performed without any difficulty if the heating is conducted very carefully and the proper point of softening is accurately observed. This little experiment indicates that the softening of the coke during the coking process must be general throughout the mass of the coal.

### The Softening or Melting of Coal

In order to investigate this phenomenon further and arrive at an exact conclusion, supported by accurate experimental data, an experiment was made in an apparatus which afforded exact temperature control and observation.

Samples of coal are cut in the form of right-angled pieces of equal dimensions in the width and length and of a thickness of 0.5 to one millimeter approximately. These samples of coal are then supported horizontally on two ends in a vertically placed transparent quartz tube, which has the same width as the coal sample. In the middle of the freshly cut section of coal, there is allowed to rest the point of a metallic needle, which is uniformly loaded. Trial tests are necessary to determine the exact manner in which the loading should be carried out. Then, when a current of nitrogen gas, which is gradually increased in temperature, is sent through the tube (this is accomplished in the simplest and most regular manner by heating one and the same current of circulating gas), and whose temperature can be exactly measured by the insertion of an element of thermo-electric couple within the quartz tube, then it is possible to determine the temperature of softening of the coal sample as the point at which it begins to sag, and the coking temperature at the beginning of the deformation of the sample of coal as the point of eventual penetration of the weighted metallic needle through the coal. As this apparatus gave accurate results, which agreed with one another, it is not without value and interest in the determination of the properties of coal and in its classification.

### Further Substantiation of Complete Melting of Coal in Coking

It was deemed advisable to attempt to further substantiate the theory that coal is completely melted or softened during the coking process. This also refers to the coking of the high melting point products that are obtained from pitch. This contention may be further qualified by stating that coal, while it may not melt absolutely completely in the coking process, contains so small an amount of non-melting constituents that their effect may be neglected entirely. To this end the high melting point but easily soluble extraction products, obtained by the treatment of coal with pyridine, are mixed in increasing proportions with the inert, non-melting bodies. To accomplish this the extraction products in solution are mixed with the finest grade of lampblack in increasing amounts, and the solvent is then evaporated, leaving a solid mixture. The samples, containing various proportions of lampblack, are heated simultaneously in a tube, one sample lying close to the other, and consequently subjected to the same conditions of heating. All of them began to melt at the same time and at the same temperature as well. Only the degree of the swelling of tumefaction was different. The extraction product, which had been mixed with 25 per cent lampblack, swelled up only half as much as the pure extraction product, unmixed with lampblack. The sample, which contained 30 per cent of lampblack, swelled up slightly, while that which contained 50 per cent of lampblack did not swell up at all, but merely sintered.

Consequently, by the addition or presence of non-melting carbon or more generally non-melting substances, the melting temperature of the extraction products was not changed, and neither was there observed any increased difficulty in the softening of the same. However, these non-melting admixtures merely have a disturbing action on the tumefaction

of the products; they act as disturbing foreign bodies in the fused mass, whose adhesion is impaired finally to such a degree by the addition of 60 per cent of these substances, that complete melting of the product is entirely prevented.

Furthermore, as it has been possible to produce from well-melting and tumefying pitch a type of product which is similar to sand coal and which no longer melts, by the extraction of a relatively small percentage of certain constituents, it appears likewise unfounded to consider this as either entirely non-melting or almost so. In all such cases we are much more probably dealing with a product whose melting point is greater than its temperature of decomposition. In these cases the lowering of the melting point or softening point below the decomposition temperature corresponds to the quantity of low melting point materials, which are made into a homogeneous mixture with these products.

In this connection attention is called to the failure to produce a coke which corresponded to the product originally obtained by coking the coal directly, from a mixture of the coal, which was extracted with solvents, and then mixed with the extraction products themselves. It will be remembered that this experiment was described in the beginning of this article, and the unsuccessful results of the same may now be explained on the same ground, as has been expounded above. If the melting of the coal were not a uniformly distributed process, that is, if it were not a process which took place throughout the entire structure of the coal, but if it were limited merely to the bituminous part contained in the coal, which is dissolved out by the pyridine solvent, then there would appear to be no obvious ground why the earlier total melting of the coal and its capability of producing coke should not have been restored by reuniting the extracted coal with the extraction products. However, if the pyridine extraction resulted in the removal of various substances, which possessed different melting points, different decomposition temperatures, from the more readily soluble part of the coal, possessing lower molecular weight and consequently a lower melting temperature, then the melting point of the undissolved part remaining is increased correspondingly. The result is that the temperature at which this remainder decomposes is lower than that at which it will melt, which then means that it will no longer melt in the coking process, conducted in the regular manner. Now, as the melting point of the extraction products lies likewise very close to the decomposition temperature, hence it is not possible by merely mixing the two substances together, that is, the extraction products and the insoluble product remaining, for the former to accomplish the solution of the latter in its viscous fused mass and to change its melting point in this manner. The product obtained from the extraction of the coal melts by itself alone, and hence it can only exert a sort of cementing action on the particle of the coal to cause them to agglomerate to a single mass.

### High Melting Point Products from Pitch Carbon

It has been shown that pitch carbon, because of the manner in which it behaves in the coking process, is not entirely pure carbon, but that it appears to be a mixture of organic compounds of high molecular weight. According to the observations that were made later in connection with the uniformity of softening of the coal throughout its structure, it also appeared that the pitch carbon contained only a small proportion of inorganic constituents. Experiments were therefore undertaken to bring this mass into solution.

In the first place, pyridine was used for this purpose, as it is a strong solvent for bituminous substances. The latter will produce a strong brown coloration in the pyridine solution; however, the hot filtered solution clears up in color when it is cooled, whereas the dissolved part in the filtrate is again precipitated in the greater proportion as a black precipitate. The substances which were investigated were nevertheless quite noticeably soluble, but pyridine did not appear to be the most suited and most active solvent for this purpose. Then aniline among other solvents was tested out for this purpose. Basing our conclusions on the intensity of the brown coloration, which was obtained by aniline in comparison with that obtained with pyridine, it was found that aniline was no better solvent than pyridine for this particular purpose. But aniline possessed the peculiarity of holding the dissolved substances in solution on cooling. Only a very fine precipitate, representing a small fraction of the total amount held in solution, was formed. Quite possibly this peculiarity of aniline in contradistinction to pyridine lay in the greater viscosity of the former. Various comparative tests of neutral oils with various viscosities proved this contention to be correct. It was found that the solvent powers of the liquids towards the high molecular weight constituents of the pitch carbon increased as the specific weight of the solvent increased. Light oil, heavy oil and anthracene oil were used in the following experiments. Light oil indicated a certain degree of solvent action when the mixture of pitch carbon and liquid was heated strongly and continuously for a long period of time. But, when the solution was cooled, by far the greatest part of the dissolved mass reprecipitated. The solvent powers of heavy oil were considerably greater. About one-third of the pitchy residues were dissolved, and only a part of the same reprecipitated after the solution was cooled. Finally anthracene oil dissolves the entire pitchy mass, leaving but 6 per cent undissolved, and it also retains the dissolved substances without precipitation after the solution is cooled. It is only after quite a long durated standing that a slight amount of a very fine precipitate is deposited.

### Use of Solvents Heavier Than Anthracene Oil

When oils are used as solvents, which have a still higher boiling point than anthracene oil, such as are obtained as a syrup mass in the process of recovering the pitch residues through distillation of the liquids used for the extraction, then the pitchy mass dissolves in these oils without any residue. The solution takes place in such a manner that when thin layers of the same are examined by the naked eye,

and also when the solution is allowed to stand for a considerable period of time, no precipitation of any sort is noticed. However, if the viscosity of such solutions is decreased by the addition of anthracene oil, then a cloudy turbidity begins to appear in the solution, and when the dilution is carried out farther, a fine precipitate is finally deposited. This phenomenon seems to indicate that the increasing solubility of the pitchy masses in solvents of increasing viscosity is primarily of a colloidal nature.

**The Solution of the Pitch Residues in Soft Pitch.**

The oils that are used to dissolve the pitchy residues, as mentioned above, may be called soft pitch. While these solutions remained clear to the naked eye, they exhibited an entirely different appearance under the microscope. They appeared to be a suspension of extremely fine particles of the solid substance in the viscous oil or soft pitch. It was accordingly thought advisable to attempt to make a clear solution, that is, one which would be optically clear under the microscope, by melting the slight part of the pitch residues, which was insoluble in the anthracene oil, together with high melting point pitch fractions to form a homogeneous mass. However, this could not be accomplished fully. Nevertheless, in this part of the pitchy residues, which was insoluble in the anthracene oil, it was also apparent that there was no free carbon present, but much more likely a particularly difficult soluble and fusible polymerization or condensation product. This product was boiled seven times in anthracene oil and washed in benzol, and then it was heated in the melting tube. Under these conditions it decomposed each and every time with the formation of fine vapors and a slight trace of a tarry deposition. It yielded likewise about 94.8 per cent of coke, which corresponds to the coke yield which is usually obtained from an anthracite coal.

Accordingly, it was found by the aid of the zylol extraction method that a hard pitch contained 35.5 per cent of pitch carbon, of which 5 to 6 per cent was insoluble in anthracene oil, while an average pitch contained 26 per cent of pitch carbon, of which 4.2 per cent was insoluble in anthracene oil.

### New Formation of Pitch Carbon

Likewise the new formation of pitch carbon, as it is carried out in the carbon-free pitch according to the following experiments, appears to point to the presence of organic polymerization products. The possibility of the existence of free carbon in the pitchy mass is afforded no further substantiation. When a current of air is blown through that part of anthracite pitch which is soluble in benzene and which does not contain any carbon at all, as this mass is heated on the water bath to the temperature of 80 degrees C. and maintained at that point for a considerable time, then after a few hours the reddish brown color of the pitch is changed into brownish black. The mass obtained in this manner gave a voluminous precipitate with xylol, which precipitate could then be dissolved in the greatest part in boiling light oil. If the carbon-free pitch were heated likewise to a high temperature in a uniform air bath and air blown through the same, then the products which have the property of being precipitated by xylol were evolved much faster and in a great amount. They also showed a correspondingly greater difficulty of dissolving in the viscous solvents.

From a purely theoretical consideration it appeared possible to reproduce this property of high melting point in the actual process of coking coal, that is, to conduct this process in such a manner that materials of high melting point will be produced. The substances which were isolated from coal tar pitch, as well as those which were produced artificially by blowing air through the mass, indicate the practicality of doing this, and likewise, by their behavior during the coking process, they substantiate in every way the assumptions that have been made regarding the coking of coal.

The high melting point pitch bodies, which are made in this manner, are extremely fine powders, which vary in color from a brownish black to a black in accordance with their melting points. When the proper pitch product is selected from the standpoint of the melting point, then its addition to coal, possessing non-coking properties, has a marked effect in making this coal yield a good coke. The advantages gained in the use of this material are further enhanced by the fact that, due to their finely powdered condition, these pitch bodies can be mixed with the coal in a very economical fashion.

### Use of the Pitch Bodies in Coal Mixtures

So it is possible to obtain a very good product by the addition of 25% to 30% of this pulverulent substance to the non-caking coal. The non-caking sintering coal is mixed with 50% of the best coking coal and then the 25% to 30% of the powdered pitch product is added. The coke that is obtained is not of the adherent type, but is an excellent thoroughly molten product. However, if the high melting point pitch product is added in whole or in part in the dissolved form to the coal, then it is observed—just as in the former case with pitch—that such a strongly marked coking effect takes place—an observation which is of great commercial and technical significance—and that in that case in the place of 25 to 30 per cent of the pitch product only an addition of 8 to 9 per cent is required to produce a coke, which is just as good in every respect as that obtained with the larger amount of the pitch powder.

Hence, when the product is used in this economical manner, it is possible to convert even lignite coal, to say nothing of other coals of better quality but unsuited from their nature for the production of coke, by the addition of these high melting point materials into a hard coke, capable of bearing weight.

### Summary

1. The effect of the addition of pitch in the coking of non-coking coals was investigated in the work which has just been described, and the following conclusions have been derived from the experimental results obtained therein:

A. The very favorable effect of the addition of pitch on the coking of coal is increased to a marked degree by its use in the dissolved state.

B. The favorable action of the addition of pitch to the coal, which was observed on a small scale, was not established right at the outset in practical operation, because the longer time of action, which was required in this case, had the effect of again nullifying the strong coking action of the pitch due to the fact that the latter was very easily melted.

2. The extracted materials, that are obtained from coking coal, when it is treated with pyridine, does not show any melting at all. They decompose, when heated strongly, and leave behind a swollen coky residue. Coking experiments, which were carried out with these extraction products, gave a frothy coke residue with a yield of about 40 per cent of the original amount of coal used. In this test it was observed that the extracted coal apparently showed the same evolution of gas, but, on the other hand, it did not possess any coking properties any longer.

3. By the admixture of the pulverulent extraction products with the extracted coals in the original proportions the earlier coking capability of the washed coal is, however, not restored.

4. An investigation was made to see if it were possible to obtain similar high melting point products from coal tar pitch, in a similar manner to which they were prepared from coking coal by an extraction process. It appeared that these materials were undoubtedly the principal cause of the coking properties of the coal. The "pitch carbon," which was obtained by the action of solvents on the coal tar pitch, contains, if not none at all, still only a small amount of elementary or free carbon and must be constituted by far in the greatest part of high and the very highest melting point hydrocarbons.

5. Coking tests which were carried out with such pitch products of different degrees of fusibility gave coke formations which are entirely similar to the coke products that are obtained from anthracite coals of different degrees of coking capability. This similarity refers to the form and the outward appearance of the coke. In this manner these pitchy products, even though they must differ in their organic structure from the natural coal, nevertheless, as far as their physical properties and method of coking are concerned, they agree to quite a considerable extent with the anthracite coals themselves.

6. The conclusion that there is no free or elementary carbon, or at least a very small amount of the same, present in the pitch is further corroborated by the fact that it is possible to produce these substances from pitch by subjecting it to air blowing, or to produce these bodies in the pitch itself in a higher concentration by the same means.

7. The experimentation that was conducted with the purpose of obtaining a coal possessing good coking properties, by the addition of such pitchy products to non-coking coals and even to lignite coals also, yielded surprisingly good results. While the addition of about 50 per cent of the best coking coal to a non-caking, sintering or sandy coal still gave no adherent coke formations, the addition of from 25 to 30 per cent of the high melting point pitch products yielded a well fluxed coke. When the pitchy products were used in a partially dissolved condition, then the same results were obtained with even as small an addition as 8 to 9 per cent of the same high melting point products.

8. The fact that it is possible to work with so small an amount of the pitch products and still produce such good results, that these substances can be prepared very readily, cheaply and with good yields from materials such as coal tar pitch, which is available in large quantities, permits the author to express the hope that the problem which has been giving the gas and coke industry so much concern in the past, namely, that of obtaining a good coke that can be used for all the purposes that coke made from coking coals is used for, from non-coking coals and even from lignite coals—the hope is expressed that this problem has been solved satisfactorily from a technical and commercial standpoint.

## N. Y. Consolidated Annual Report

(Continued from Page 72)

"The combined gas sales of the Consolidated Gas Company and its allied companies in the Boroughs of Manhattan, the Bronx and Queens and in Westchester County, amounted to 1,152,872,500 cubic feet more in 1922 than in 1921, an increase of 3.18 per cent, as compared with a decrease of 4.78 per cent in 1921 below the previous year.

"The combined sales of gas of the various companies during the year were 37,434,823,500 cubic feet, an increase over the previous year of 3.18 per cent.

"The sales of electric current during the year, including that sold to the Third Avenue Railroad Company, the Brooklyn Rapid Transit Company, the New York, New Haven & Hartford Railroad Company and the Hudson and Manhattan Railroad Company, amounted to 1,343,977,025 kilowatt hours, an increase over the preceding year of 13.29 per cent.

"The taxes charged against the earnings of the Consolidated Company and its allied gas and electric companies during the year amounted to $12,463,-158.46, as compared with $9,840,077.92, charged against the earnings of the preceding year.

"At a cost of $10,157,164.82 for repairs and $4,041,-745.42 for renewals or a total cost of $14,198,910.24 all of these gas and electric properties have been maintained in excellent repair and at the highest possible point of operating efficiency, thus insuring a uniformly satisfactory quality of gas and electricity and their economical production and distribution."

At the annual meeting of the Consolidated Gas Company January 22, Lewis B. Gawtry was elected a director in place of Horace W. Fuller, resigned.

## Alabama Coal Production Increased

Birmingham, Ala.—Production of coal in Alabama fields during 1922 was 16,630,000 tons, an increase of 3,613,000, or approximately 25 per cent over the production of 1921, according to figures compiled in the office of the Alabama Mining Institute and estimating for reported tonnage. Total production in 1921 was 13,015,000 tons.

Consider now the Peddler,
That very sporty chap
Who travels up and down the land
To each place on the map.
He playeth havoc with the hearts
Of all the country chicks,
And swappeth sundry smutty jokes
With all the small town hicks.
Now in the morn, ere light hath come
From bed ariseth he
And sleepily puts on his clothes
To catch the six-o-three.
Beneath the lunch-room table
He parks his pair of legs
And eats a soggy breakfast
Of cakes or ham and eggs.
And when to work he goeth forth
He finds to his amaze
His customer is in New York
To be there several days.
Tired, sore and downcast
He walks in the depot gate
And finds the train he wants to take
Is just four hours late.
Ah, envy not the Peddler
Though his lot seems bright to you,
Despite his loafing, now and then,
Some work he has to do.
And if you think the life he leads
Is one of joy alone,
Remember that the Peddler
Has some troubles of his own.

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## A Study in Natural History

### The Elk

A study of the fauna of different lands brings us to what is without doubt the most interesting animal in the world, viz., the Elk. The Elk is found mostly in the United States, and are quite plentiful here; in fact, you can hardly find a city, town or hamlet in which they haven't a home.

An Elk is very much like a camel; it can get along without a drink for a long time; but on the other hand it will take on board a two week's supply in one night.

The Elk has never been properly classified, owing to the fact that whenever a scientist began to study it at close range, he awoke next morning with a headache and no recollection whatever of what happened the night before.

The chief characteristic of the Elk is its button. They are very fond of diamonds, the prevailing style being to have its head and several teeth studded with them.

There are some tame Elks, but they are few and far between. Scientists explain this by saying that as soon as one shows signs of becoming domesticated its friends get it out some evening and persuade it to go back to nature. Notwithstanding this fact, a great many girls have tried to make household pets of them, but few have succeeded.

Elks often climb the ladder of fame, becoming prominent actors, lawyers, doctors and merchants. Most of them, however, become peddlers.

It seems to be a part of the nature of an Elk to keep its habits a secret but the observing person is compelled to admit that the Elk is a peculiar animal and is worthy of much study and thought.

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Jim Conroy has a suspicion that form letters are dangerous. Not long ago he wrote a letter of complaint to a Western railroad explaining in detail why he preferred to sit up all night in a smoking compartment rather than share his berth with—(oh, you are mistaken)—with a fine lot of bugs that are not called by their first name in polite society.

The letter of apology Conroy received was so much of an apology and so reasonable in explanation that he felt that he had perhaps been unreasonable in filing his complaint, until he happened to notice that his original letter had been returned through mistake and on it had been scribbled in a blue pencil.

"Send this guy the bedbug letter."

## That "Gas Shut-Off"

Reversing tracks,
And calm enough,
Our Mayor backs
That "gas shut-off."
Though he could see,
Not long ago,
To realty
An awful blow.

Without a "hem,"
Without a cough,
The tide he'll stem;
That "gas shut-off"
He knows will win
Applause from all
If first put in
At City Hall.

—J. A. in *Brooklyn Eagle*.

Since then its passed,
They put it through.
Of course they "gassed"—
They always do.
T'will cost a lot,
And though you scoff,
The Mayor got
His gas cut-off.

# Public Utilities Securities Market Report

## Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

| Company. | Jan. 11, 1923 | Maturity | Jan. 25, 1923 Bid | Asked |
|---|---|---|---|---|
| American Lt. & Trac. Co. | Five Year 6s | May 1, 1925 | 109½ | 110½ |
| Brooklyn Union Gas Co. | First Consol. 5s | May 1, 1945 | 95 | 97 |
| Columbia Gas & Elec. Co. | First 5s | May 1, 1923 | 95½ | 96 |
| Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore | First Ref. 7½s | Dec. 1, 1945 | 110 | 111 |
| Consol. Gas, Elec. Lt. & Pr. Co. | General 4½s | Feb. 14, 1935 | 91½ | 92½ |
| New Amsterdam Gas Co. | First Consol. 5s | Jan. 1, 1948 | 84 | 86 |
| Denver Gas & Elec. Co. | Gen. (now 1st) 5s | May 1, 1949 | 92½ | 94 |
| Detroit City Gas Co. | Gold 6s | Jan. 1, 1947 | 100¼ | 101¼ |
| Equitable Illum. Gas Lt. Co. of Philadelphia | First 5s | Jan. 1, 1928 | 101½ | 103 |
| Hudson County Gas Co. | First 5s | Nov. 1, 1949 | 94⅛ | — |
| Laclede Gas Light Co. | Ref. & Ext. 5s | Apr. 1, 1934 | 94½ | 95 |
| Louisville Gas & Elec. Co. | First & Ref. 7s | Called Dec. 1 | 100 | — |
| Michigan Light Co. | First & Ref. 5s | Mar. 1, 1946 | 91 | 92 |
| Milwaukee Gas Light Co. | First 4s | May 1, 1927 | 93 | 93¼ |
| Pacific Gas & Elec. Co. | Gen. & Ref. 5s | Jan. 1, 1942 | 91½ | 92¼ |
| Pacific Gas & Elec. Co. | First & Ref. 7s | Dec. 1, 1940 | 107 | 109 |
| Cal. Gas & Elec. Corp. | Unif. & Ref. 5s | Nov. 1, 1937 | 96 | 96½ |
| Peoples' Gas Lt. & Coke Co. | Refunding 5s | Sept. 1, 1947 | 92 | 92½ |
| Chicago Gas Lt. & Coke Co. | First 5s | July 1, 1937 | 95⅞ | — |
| Portland Gas & Coke Co. | First & Ref. 5s | Jan. 1, 1940 | 90½ | 92 |
| Seattle Lighting Co. | Refunding 5s | Oct. 1, 1949 | 83 | 85 |
| Southern California Gas Co. | First 6s | Nov. 1, 1950 | 97½ | 99½ |
| Utica Gas & Electric Co. | Ref. & Ext. 5s | July 1, 1957 | 93 | 95 |
| Washington Gas Light Co. | General 5s | Nov. 1, 1960 | 95 | 96 |
| Western States Gas & Elec. Co. of California | First & Ref. 5s | June 1, 1941 | 91 | 93 |

### Financial Statement.

Halsey Stuart and Company has purchased $383,000 Denver Gas and Electric company first and refunding mortgage sinking fund 5½ per cent gold bonds, due May 1, 1951. The bonds were issued under an old mortgage, dated May 1, 1911, and are secured by a first mortgage lien on substantial property of the company. The earnings for the twelve months ended November 30, 1922, were: Gross, $5,956,108.01; net, $1,987,753.76; annual interest requirements, $841,477.50.

The bonds were offered at 98 and interest, to yield about 5.80 per cent.

* * *

Stockholders of the Producers and Refiners, approve the increase in the common capital stock from $27,000,000 to $47,000,000. The P. and R. will acquire the Fensland Oil Company and the Lyons Petroleum Company. Thirty-five shares of P. and R. for 100 Fensland, and one share of P. and R. for 50 Lyons. The rest of the stock will be held for advancements etc.

* * *

Buckeye Pipe Line declares a quarterly dividend of $1.75, payable March 15 to stock of record February 15. The company paid a $2 quarterly dividend previous to a $25 extra dividend in November.

* * *

### Gas Rate Increase Request Dismissed

Kansas City, Mo.—Applications made to the Kansas public utilities commission last summer by the Kansas Natural Gas company and the Wyandotte County Gas Company for an increase in rates of 5 cents for each 1,000 cubic feet have been dismissed by the commission at the request of the applicants. Notice of the dismissal as received from Topeka by Mayor Harry B. Burton of Kansas City, Kan., and Hugh J. Smith, city attorney.

Last June the Kansas Natural Gas Company asked for an increase from 35 cents to 40 cents from its distributing companies. The public utilities appealed to the Supreme Court and the court ruled that the application for increase would have to be passed upon by the public utilities commission.

The Wyandotte County Company filed for an increase, so as to offset the increase that was demanded of it by the natural gas company.

### Gas Stock Three Times Subscribed

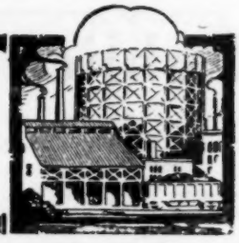
New York.—The offering of $15,000,000 Consolidated Gas 6 per cent cumulative preferred stock was subscribed to the amount of $50,000,000, according to a company announcement. Applications for the stock from employees and consumers were more than three times the total offered, and came from 60,000 persons, ranging from one share to as high as 4,000 shares.

Ten thousand subscribed for one share each, 12,000 for two shares, 3,000 for ten shares, and 6,000 for twenty shares. The heavy subscription will necessitate fixing a maximum allotment.

### Former Gas Official Joins Bank Staff.

Martinez, Calif.—Walter Pilgrim, former local manager of the Contra Costa Gas Company, has joined the staff of the Bank of Martinez, it has been accounced by W. A. Hale, cashier. Pilgrim will succeed S. L. Threlheld, who recently resigned to go to Los Angeles. Pilgrim recently returned from the South, where he has been for the past year.

# NEWS OF THE GAS INDUSTRY



### Gas Mains Are Being Laid in Castro Valley

Hayward, Calif.—Castro Valley is being supplied with gas mains. Work on laying of the mains, which was started recently, is proceeding rapidly, it has been announced by William Oswill, local manager for the corporation putting in the system. The system, Oswill said, will extend out Castro Valley and Redwood road, possibly to the Castro Valley schoolhouse. Efforts are being made by the Castro Valley Parent-Teacher Association and the Board of Trustees of the Castro Valley school to have the mains extended to the school building. Should their efforts be successful, it was announced, the school will institute a modern domestic science department.

### Will Extend Mains

Norfolk, Va.—City gas service will be given Meadowbrook, Algonquin Park and Riverfront within the next few weeks, it is announced by T. Norman Jones, general manager for the City Gas Company.

Material for extending the main which serves Larchmont and now terminates at the United States Public Health Service Hospital across Tanner's Creek and along North Shore road has been ordered and work will begin as soon as it arrives.

Lateral mains will be run from the main on North Shore road down the important side streets so that all dwellings will be served.

### News Concerning Arkansas Natural Gas Company

Middle January, President J. C. Trees of the Arkansas Natural Gas Company stated that the proposed consolidation of his company with the Union Oil of California and the Transcontinental Oil Company is being considered. The plan does not contemplate the absorption of one by the other, but a general merger of the three.

### White River Dome Pronounced a Gas Field.

Concomitant with the unearthing of 18,000,000 cubic feet of gas by the White River Oil Company, near Meeker, Colo., M. D. McEniry, chief of the field division of the general land office, Colorado, says: "Information received designates the White River Dome, extending from eighteen to twenty-two miles down the White River from Meeker, Colo., as a producing gas field. The dome covers 13,208 acres, according to the designation, and is in townships 1 and 2 N. ranges 96 and 97 W. The field now comes under the provisions of the government's oil and gas regulations, paragraphs 3 and 25." Maps have been made.

### Gas Plant to Be Enlarged

Emporia, Kans.—The Gas producing capacity of the Emporia Gas Company's plant will be doubled by the installation of new machinery in 1923, according to Carl B. Wychoff, manager of the company.

Repairs will be made at the plant, and a new supply main will be laid from the plant north to Fourth Avenue and westward on Fourth Avenue as the needs for service increase. Employment for about twelve extra men will be provided by these improvements, for which the contracts have already been let, Mr. Wychoff said.

### James L. Richards is Florida

Boston, Mass.—James L. Richards, president of the Massachusetts Gas Companies, left on January 20 for a trip to Belleair, Fla.

### Boston Co. Building Syphons

Boston, Mass.—Contract has been awarded to T. A. Scott Company 364 Border street, East Boston, for syphons at Chelsea Creek, East Boston, for the Boston Consolidated Gas Company, 149 Tremont street, Boston. The syphons will be constructed of concrete and cement. The project will cost $30,000.

### Combustion Utilities Corporation Formed

It has been announced that the Improved Appliance Co. has been coupled with the Industrial Heating Department of Henry L. Doherty & Co. under the name Combustion Utilities Corporation, with offices at 24 State street, New York.

### W. T. Pease Joins Hoffman Heater Co.

W. T. Pease, who for the past several years has been manager of the New England Branch at Boston, of the Ruud Manufacturing Company, has severed his connections with the above concern and has joined the sales staff of the Hoffman Heater Company, at Lorain, Ohio. Mr. Pease will be district manager in charge of the Eastern Hoffman Branches.

### Novelty Calendar for 1923

The Pittsburg Water Heater Co., Pittsburgh, Pa., has issued a most interesting calendar this year for their friends and patrons. This calendar has a separate page for each week, and under each date is given a delectable recipe or an important household hint. It is a very unique idea, and will undoubtedly prove a valuable aid to the gas company.

### Mrs. Geo. G. Ramsdell Dead

Mrs. Mary C. Ramsdell, wife of George G. Ramsdell, of American Gas Association headquarters, died at her home January 20. Services were held January 22 and interment was in Vincennes, Ind. The entire gas industry will extend its sympathy to Mr. Ramsdell in his loss.

### Sells Preferred Issue

Boston, Mass.—The Beacon Oil Company, in which the Massachusetts Gas Companies own a stock interest of slightly under 50 per cent, has sold the remaining $1,000,000 of its 7½ per cent preferred, making the authorized and outstanding amount $2,500,000.

## Need for Standardization

By Albert W. Whitney, *Chairman Engineering Standards Committee.*

The need for standardization arises out of two situations. In the development of a new project the first in the field are the inventors. Of necessity they have to try out a large number of ideas; many of these prove to be useless and of those that are valuable some are better than others. Inventors are not the people to clear up the confusion in which they have left things; that is not their business, but somebody must make a selection among this confusing and unnecessary variety.

But in addition the field gets unnecessarily littered up by the casual development of the business, largely through competitive influence exerted through the sales organization.

It is the job of the standardizer to take care of both of these situations; he must out of this variety select those things and those ideas that are best worth keeping.

This has two effects. It produces greater efficiency; by a reduction of the multiplicity of processes and products it allows for concentration on those that are worth while; the resulting increase in efficiency is effective all along the line, not merely in manufacturing but in selling and in buying. This is the common view of standardization and is so well understood that I need not dwell on it further.

But in addition to this, standardization does something else that is equally important. It frees the human spirit for making further advances. If there were no standardization the creators of ideas would have to be continually recreating and would have no time for further advance. Whenever a bolt or an I beam or a generator was needed it would have to be a matter for design. Standardization allows such needs to be taken care of through routine process and the creative spirit is relieved for fresh first-hand adventures.

Standardization instead of killing invention and initiative is the very basis upon which it rests. It is standardization that makes further invention possible.

I have had something to do with the safety movement and the situation in that field is somewhat the same. I could not feel happy at first for safety seemed to kill adventure. Its inhibitions seemed to take the snap and sparkle out of life. I could not be contented until I had thought the thing through and realized that the real aim of the safety movement was substitution and not subtraction. It substituted a real adventure for a poor adventure. It is a very stupid adventure to get ground up in a lathe or to be mangled under the wheels of a street car. The safety movement saves life for the express purpose of having a real adventure. The safety movement, therefore, is not negative, but distinctly positive. I have something to do just now with getting safety education into the schools; I should go into this work with much less interest if it were not that it had this larger duty of increasing the values of life and of raising the standard of life to that of a real adventure.

Similarly I could not feel happy in the standardization movement until I came to realize that it did not produce stagnation, but rather created a basis upon which to build fresh adventures in creative development.

There is a very good analogy in the development of the body and mind. To a remarkable extent both the body and mind are standardized. If our bodies were not essentially alike we could have no surgery or medicine, for a surgeon in operating for appendicitis might find a heart when he was looking for an appendix. If our minds were not essentially alike we could have no organized education; education would have to be an individual process.

The similarity of our bodies and minds affords the underlying basis on which we can construct social life and civilization and yet it is the departure from the standard which gives the touch of individuality and which not only gives the charm to our social contacts, but which makes the cutting edge of progress.

There is a danger in standardization, the danger of too early standardization and too drastic standardization, but there is a danger connected with the use of any powerful instrument. The problem of civilization and progress is to a very great extent a problem in the wise use of standardization.

I have used the term standardization in the broadest possible sense. Every factory, for instance, is carrying on its own standardization; every industry is carrying on its own standardization. Some of this work is on a very large scale, in the automotive industry, for instance. But there is a standardization which transcends these in that it endeavors not only to operate on a national scale and to cover all industries, but to bring all points of view, that of the manufacturer, the consumer and the public to a common focus.

There are three organizations that are bearing the brunt of this work the United States Chamber of Commerce, the Department of Commerce of the Federal Government and the American Engineering Standards Committee.

The United States Chamber of Commerce is doing a valuable work in interesting manufacturers in standardization and particularly in simplification. It has been the direct cause of considerable work that has been done in this field that is of a national character.

The Department of Commerce is advancing standardization in two ways; in the first place, through the Bureau of Standards, a very valuable adjunct to the government. The Bureau of Standards, both as a research institution and as a co-ordinator of government activities in standardization and as a co-operator with industry itself, is doing a most valuable work.

In addition to the Bureau of Standards, Mr. Hoover has initiated a new department known as the Division of Simplified Practice which is engaged on the non-technical side of the field of standardization. It endeavors to bring manufacturers together through their trade associations in adopting comprehensive plans in reduction of the unnecessary variety that is found in industry.

The third national standardizing body is the American Engineering Standards Committee. This was founded four years ago by a number of leading engineering societies. At present the membership consists of: the mechanical engineers, the civil engineers, the mining engineers, electrical engineers, the Society for Testing Materials, and the Automotive engineers; the Government Departments of the Army, the Navy, Commerce, Agriculture, the Interior the Panama Canal, electrical manufacturers, the central stations, both electrical and gas; the steel manufacturers, the architects, the steam and electric railways, fire protection interests and the safety interests.

This body serves as a clearing house for standardization. It does not initiate standardization projects nor does it do standardization work itself. It encourages standardization and it provides a general outline of procedure which if followed will entitle the standard to be listed as an

approved American standard. This standard is in no sense mandatory but in actual practice it does to a very considerable extent, because of its intrinsic merit and the representative way in which it was produced, become the American standard in its field.

The process is this: When there has been brought to our attention in a convincing way the fact that there should be standardization in a given field, a conference is called and to this conference are invited all national associations and other representative bodies that are known to be interested. This conference decides whether standardization should be undertaken and if the decision is in the affirmative it makes a recommendation to that effect to the American Engineering Standards Committee and also with regard to the national association or other representative body which shall act as sponsor in the preparation of the standard.

The sponsor that is chosen by the American Engineering Standards Committee creates a sectional committee. This sectional committee is not a committee of the American Engineering Standards Committee but directly represents the bodies that are interested in the particular standardization project. When the sectional committee has completed its work the standard is turned over to the American Engineering Standards Committee for approval. The American Engineering Standards Committee does not pass upon its technical details, but solely upon the question of whether the work has been performed in a thoroughly representative way.

The American Engineering Standards Committee has more than 120 projects under way at the present time, 28 of which represent standards that have been actually approved. On the last count, I believe there were 222 national associations that were working on sectional committees represented by some thousand individuals. It will readily be seen, therefore, that a large part of the industries of the country are actually represented in this work.

### Splendid Gas Well.

According to information credited to G. W. Staley, state geologist for Wyoming, the Carter Oil Company's well on the Billie Creek structure south of Sheridan, Wyo. is producing 80,000,000 cubic feet of gas daily. The well came in about a week ago, and is still uncapped, up to middle of January.

### Koppers to Build Ovens in Salt Lake City

The Koppers Company has received a contract from the Columbia Steel Company covering the erection of a by-product coke plant at Salt Lake City, Utah, in connection with the blast furnace to be installed at that point. The by-product coke plant will consist of thirty-three ovens of the Koppers Company's new design, having a capacity for carbonizing approximately one thousand tons of coal per day.

It is interesting to note in this connection that Utah coals will be used, this being the first installation of by-product ovens to carbonize such coals.

Construction work will be started at once and it is expected that the plant will be completed in about a year's time.

### Ruud Branch in Oklahoma City

The Oklahoma City, Okla., Direct-Factory Branch of the Ruud Manufacturing Company has moved into new quarters at 727 North Robinson Avenue.

The branch is in charge of Geo. R. Manchester, who has been connected with the company for seven years. Previous to this time, Mr. Manchester was a master plumber and is therefore well equipped to serve merchandising plumbers and gas companies.

A complete stock of all types and sizes of Ruud automatic water heaters is carried.

### Colorado Incorporation

The Green Mountain Oil and Gas Company has been incorporated for $40,000. The incorporators are L. C. Fulenwider, E. E. McKee, Golden Fairfield. The home office is in Denver. The company has secured leases on more than 1,000 acres in the vicinity of Rifle Range, Colorado, which is between Denver and Golden, and they will start early drilling for oil and gas.

### Expansion Joints

(Copyright 1923 by W. F. Schaphorst)

Ever since metal pipes have been used, the care of expansion in long lines has been an important problem. Not so many years ago it was a very serious problem. All sorts of devices were employed, varying all the way from swing and sliding joints to bellows-type expanders. Although all of these devices may be more or less successful, depending upon conditions, the method that is most popular today is the liberal use of pipe bends with Van Stone joints, provided space conditions permit.

Where expansion must be effected in a straight line—where no loops or bends are practicable—the sliding joint or corrugated copper joint may be used. Of the two the corrugated type is preferable because it does not need packing, does not stick, does not require lubricant, and does not get out of alignment. By this I do not mean that *all* straight line expansion joints give trouble. The best ones do not give trouble. The trick is, therefore, to pick the *best* ones. The bellows-type is very often objectionable because if made of copper or alloy it will not carry steam of as high temperature as will a steel or iron pipe bend. Also, care must be exercised in the selection of the bellows-type expansion joint lest constant expansion and contraction may cause cracking in the corrugations. Before making a selection the advice of the manufacturer should be sought. All details as regards kind of service, external and internal temperatures, length of pipe, size of pipe, etc., should be given so that the manufacturer can advise intelligently.

## Installing Street Lighting

Webster, Mass. — Officials of the Webster & Southbridge Gas & Electric Company have announced that work of installing the ornamental lighting system on Main street and the business district will start this spring. The job was scheduled to be completed this fall, but necessary supplies were not received. After the frost was evident the merchants gave up hopes of having the new system this winter.

## Oil News

The annual meeting of the stockholders of the Salt Creek Syndicate will be held at Cheyenne, Wyo., February 3.

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The federal trade commission enters an order dismissing the action brought before it some time ago against the Big Bear Oil Company, the William G. Krape Investment Company, Inc., and William G. Krape. The Big Bear Company owned a lease in the Big Muddy district and drilled a well, which failed to produce. Dismissal because of insufficient evidence, etc.

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Stockholders of the Continental Oil Company in annual meeting increased the directorate from five to seven, reduced the par value of the company's shares from $100 to $25 and elected E. T. Wilson, president. H. T. Cleaver having retired.

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Experts admit that Smackover oil field is giving up an abundance of oil, but it is of low gasoline content and is best for fuel purposes.

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The contract between the Midwest Refining Company and the State of Wyoming for the royalty oil section 36-40-79, Salt Creek field, has expired. The company wishes to renew; the state says, "An open, fair and impartial bidding will be necessary to say who gets it." It's a case of the highest bidder this time.

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Production from Salt Creek in December, 1921, averaged 56,209 barrels a day. In December, 1922, the average was 87,781 barrels a day.

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The Producers and Refiners Corporation have acquired a large acreage about three miles from Gallup N. M., and will drill.

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Governor Haskell, head of the Haskell Oil interests, announces the closing of a twenty-five-year contract with C. M. & St. P. Railroad, whereby the Middle States Oil and Southern States Oil will have complete railroad and pipe line facilities for transportation of Wyoming and Montana oil and coal over the St Paul system.

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A bill has been introduced in the Wyoming House, requesting Congress and the Interior Department to require that all oil produced on Government land in the State of Wyoming be refined within its borders. It is stated the piping of the oil to foreign states deprives Wyoming of its most valuable resources, and enriches the other states.

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## "Types of Customers"

According to the "World Retailer," a magazine published by the "New York World" for the benefit of those interested in retail selling there are seven distinct kinds of customers.

### *The Self-Contained Type*

The first classification is the Self-Contained Citizen, who knows what he or she wants and gets it. This type, according to the "World Retailer," is swayed neither by passion nor sentiment. Knows service when he sees it and appreciates it. This is the type of customer that may be considered as a logical prospect for future sales. This type is always open to conviction and buys whenever real merit is clearly explained. If never mistreated in value or in service this customer becomes permanent.

### *The Timid Type*

The second type is the Timid Customer. It is this type that must be handled with gloves. The timid customer is very responsive to extra kind and considerate treatment. The sales person who gains her confidence finds her a rich field for additional sales—for she dislikes to shop around. On the other hand, she is easily lost through discourtesy or lack of attention.

### *The Arrogant Type*

The third kind, and directly opposed to the timid customer, is the arrogant shopper. Everybody knows her, says the Retailer. She sails up to the counter and proceeds to tear the good temper and kind disposition of the salesman to bits. She deliberately tries to provoke an argument—and when she gets it, complains of impudence. To handle her properly is a difficult problem. The best way seems to be to treat her as impersonally as possible. Arrogant women are not as a rule free spenders, but if properly handled can, according to the "World Retailer," be made to pay a profit on the space they occupy before the counter. The advice in connection with this type is good—which is, briefly, "Don't lose your temper and permit yourself to show the same lack of breeding that your customer has."

### *The Irritable Type*

The fourth type is the irritable customer. When confronted with the impatient, irritable woman who interrupts you constantly and contradicts you, remember you are dealing with a sick person and act accordingly. Do not contradict. Ignore unwarranted objections or statements. With a little gentleness, irritable people are surprisingly easy to sell. This is natural, for sales resistance is weakened by irritability

### *The Social Type*

The fifth type of customer enumerated by the "World Retailer" is one the editor of this publication has had little experience with. There are two species naturally—the male and the female. Bearing in mind that Kipling said, "The female of the species is more deadly than the male," we will discuss the female first. The "World Retailer" says: "She is often a large blonde, guadily adorned with cheap jewelry, who calls you 'dearie' and is fond of samples." The writer knows lots of salesmen who read this publication whom, by any stretch of imagination, he could not conceive of being called "dearie"—hence, as stated, he can't say much about this specimen. The male is even more obnoxious. He tries to make a social affair out of a business deal.

The recipe for this type sounds good. "Be freezingly impersonal, ignore all openings. Don't get into a kidding match. And don't neglect other customers for this type, for they are cheap people. They rarely have charge accounts. They are never steady customers."

### *The Friendly Type*

Number 6 is the friendly type. This, we are informed, is a democratic soul who sees no social distinction between one side of the counter and the other—who is looking for real human values as well as purchases—and who forms friendships that are often valuable. Be conscientious with the friendly customer—consider her pocketbook as you would your own and see that she does not spend more than she ought. She will understand you and appreciate your courtesy.

*The Suspicious Type*

Number 7 is the suspicious type. She is always on her guard and is sure to brag that she kept you from stringing her. She spies an enemy behind every counter.

Give the suspicious customer what she asks for. Let her lead the conversation. Don't push her and she will buy freely. Be very exact in every statement. She is looking for an opportunity to trap you in an untruth, and she is bound to make you out a liar if she can. She is likely to change her mind when she gets home and send her purchase back.

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**Keokuk Co. Adds to Water Gas Equipment**

The Gas Machinery Company of Cleveland, Ohio, has been awarded contract by the Keokuk Electric Company, Keokuk, Iowa, for a new 6 foot double superheater carburetted water gas apparatus.

The contract includes the complete 6 foot set with overhead brick operating floor, reverse steam connections, oil pumping equipment, air and steam meters, explosion check valve and auxiliary equipment.

This new set will be placed next to the 6 foot set that the Gas Machinery Company furnished in Keokuk several years ago and will insure the supply of gas for the increasing demand and enable the gas company to maintain the high grade of service that it has always given in the past.

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**Change in Personnel**

The Advertising Department of the Dodge Manufacturing Corporation will be under the direction of William W. French, Advertising Manager, and the activities of this department will include a complete program of dealer co-operation. The entire resources of this department will be at the disposal of dealers for developing local campaigns on Dodge products and extensive plans are under way for direct-by-mail and other forms of dealer helps.

**Gas Office to Move**

Ottawa, Kan.—The local offices of the Empire Gas & Pipe Line Co., which have been maintained at 233 South Main street for the past three years, will be vacated by the company, it is announced by M. B. Buckley, local manager. The offices were brought here to install the three-part gas rate plan in the local gas service.

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**Indiana Association to Meet May 7-8**

The annual meeting of the Indiana Gas Association will be held May 7 and 8 in the West Baden Springs Hotel, West Baden, Ind. The Arrangement Committee previously had considered holding the meeting in April, but because of the possibility of unsettled weather the committee decided to select the early part of May instead.

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**Mrs. Mary Colby Dead**

Brunswick, Maine. — Mrs. Mary (Parker) Colby, wife of Lincoln H. Colby, for many years head bookkeeper and cashier for the Bath & Brunswick Light & Power Company, died at her home on Main street, following an illness of heart disease, aged 49 years. She leaves her husband, a former chief of police and deputy sheriff of Brunswick, mother, sister and two stepdaughters.

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**Koppers Liquid Purification Plant at Boston, Mass.**

The Koppers Company has received a contract from the Boston Consolidated Gas Company, Boston, Massachusetts, covering the erection of a 6,000,000 cubic feet daily capacity liquid purification plant.

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**Declares Dividends**

Boston, Mass. — The Massachusetts Gas Companies has declared a dividend of 1¼ per cent on the common shares of the company, payable February 1, to stockholders of record on January 18. The announcement was made by E. N. Wrightington, treasurer.

# FINANCIAL NOTES

Central Power and Light Company, a Massachusetts corporation, is offering $3,000,000 first lien and refunding 6½ per cent gold bonds, 1952 series, at 97 and accrued interest, to yield about 6.75 per cent.

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Stockholders of the Continental Oil Company voted to reduce the par value of its stock from $100 to $25 and to provide for seven members on the directorate. The new stocks will be issued at once.

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Shell Union Oil Corporation declared the regular quarterly dividend of $1.50 on the cumulative "A", payable February 15 to stock of record January 30.

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Humphreys Oil Company declares dividend of 75 cents a share payable March 15, to stock of record February 28. Prior to the declaration of the 75 per cent stock dividend four shares received quarterly $5, now as seven shares they receive $5.25. It is informally reported that the profits in 1922 were $10,000,000.

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Salt Creek Consolidated Oil Company declares the regular dividend of 25 cents a share, payable April 1 to stock of record of March 15.

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Marine Oil Company declares the regular dividend of 2 per cent. payable February 5 to stock of record February 1.

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The Pan-American Petroleum and Transport Company will create an issuance of $25,000,000 7 per cent cumulative preferred stock and increase the common from $125,000,000 to $205,000,000, the latter being all class "B" which has a par value of $50. The preferred will be used for new acquisitions, portion of the new to be used in paying recent dividends declared.

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United Light and Railways Company is calling for redemption at 106½ and interest to February 10, 1923, all of its 8 per cent bond secured gold notes due November 1, 1930.

### Oil Production in U. S.

Washington, D. C. — Gasoline production in the United States continues at a near-record clip, the output for November coming within 2,600,000 gallons of the record monthly production figure attained in July, 1922, according to the United States Bureau of Mines. The November production amounted to 567,100,921 gallons, which is 1,000,000 gallons above the October output and 135,000,000 gallons, or 31.31 per cent, above the production figures for November, 1921.

The demands of the nation's millions of internal-combustion engines continue to maintain gasoline consumption at a dizzy pace. Domestic consumption of gasoline in November totaled 470,043,173 gallons, an increase of 120,000,000 gallons, or 34.09 per cent above the consumption figures for November, 1921. November gasoline consumption figures were, however, 19,000,000 gallons below the October consumption mark, due, doubtless, to the advance of winter and the consequent curtailment of automobile activities. Stocks of gasoline on hand December 1 amounted to 776,723,619 gallons, an increase of 53,000,000 gallons during the month. Exports of gasoline in November were 41,085,149 gallons; shipments to insular possessions were 2,833,042 gallons.

During November 306 refineries reported to the Bureau of Mines as operating, and these ran through their stills a daily average of 1,473,449 barrels of crude oil and 157,922 barrels of other oils. The daily indicated capacity of these refineries was 1,869,820 barrels, an increase of 1.37 per cent over the previous month. Total oils run to stills in November showed an increase of 2.86 per cent as compared with October.

Production of kerosene in November amounted to 234,436,275 gallons, an increase of 19,000,000 gallons over the figures for October and of 59,000,000 gallons over the November, 1921, figures. Stocks of kerosene on hand December 1 were 257,878,898 gallons the figure being about 1,600,000 gallons above the stocks on November 1, but about 82,000,000 gallons less than on December 1, 1921.

Production of gas and fuel oils in November amounted to 891,590,171 gallons, a decrease of 30,000,000 gallons from the October production, but an increase of 92,000,000 gallons over the production for November, 1921. Stocks of these oils on December 1 amounted to 1,352,347,667 gallons, a decrease of 14,000,000 gallons during the month.

Production of lubricating oils in November was 89,270,847 gallons a slight increase over the October production and an increase of 8,000,000 gallons over the production in November, 1921. Stocks of lubricating oils on hand December 1 amounted to 226,429,537 gallons, an increase of 9,000,000 gallons during the month.

## Building Coal Trestle

Springfield, Mass.—The Springfield Gas Light Company has started work on the construction of a large concrete and steel coal trestle at their plant on Bliss Street, this city, to cost about $10,000. The contract has been awarded the Berlin Construction Company, of Berlin, Conn., and will be the latest type of steel coal trestle construction.

### Concerning House Heating with Gas.

The Denver Gas Company's venture to make Denver, Colo., a "smokeless city" is apparently making the proper headway, as may be evidenced from the following unsolicited testimonial:

"Department of Safety and Excise
106 City Hall
Denver, January 9, 1923.

"Clare N. Stannard,
Vice-President and General Manager, Denver Gas and Electric Company, Denver, Colo.

"Dear Mr. Stannard:

"I take pleasure in advising you that the gas-heating plant which was installed in my home about November 1, 1922, has been operating to our entire satisfaction.

"During the two months that it has been operating it has demonstrated conclusively that all dirt and dust have been completely eliminated.

"Our house has nine large rooms and at all times it is heated to our entire satisfaction. It appears to me that this method of heating houses is a distinct advance in that line of work.

"I shall be very glad to have you refer anyone contemplating the installation of service of this character to me, as I have nothing but words of praise concerning the operation of this heating plant.

Yours truly,
(Signed) Frank M. Downer."

While the letter of commendation of Denver's manager of safety and excise has been cited, many others have been received and are coming in daily. Because of these glad tidings, gas heating is said to be a success.

### $1.50 Gas Rate for Ottumwa

Ottumwa, Ia.—Members of the city council indicate an intention to reduce the gas rate in Ottumwa from $1.60 to $1.50 or less.

A. J. Gross, manager of the Ottumwa Gas Company, offered with figures to show the commissioners that present business conditions would not justify the company in offering any reduction in gas rates at this time. Last March the $1.60 compromise was effected by a mutual agreement, the present rate being the result, the company making a reduction from $1.80, the war period's high point, to $1.70 and the city asking $1.50.

According to Mr. Gross, the company has a very favorable contract for cost at this time, but will have to accept an increase in the price, in all probability, about April 1, when the contract now in force expires. He told the commissioners the two previous reductions were made in advance of reduced operation costs, and were not justified at the time they were made.

### Re-elect Gas Company Heads.

Kansas City, Mo. — Officers of the Kansas City Gas Company were re-elected at the annual meeting of stockholders. George E. Nicholson is president; J. W. Dana, vice-president and general counselor; C. W. Green, vice-president and general manager; James M. Kemper, treasurer; M. J. Barry, secretary, and Frank Carpenter, assistant secretary. All of the officers are directors. Other directors are W. S. McLucas, George E. Cole, J. A. Harzfeld, H. M. Woolf, Clifford Histed, W. A. Oldham and F. C. Niles.

## Mayor's Bill Would License Gas Fitters

Boston, Mass.—The bill of Mayor Curley to include gas fitters with plumbers, under the law requiring that such mechanics be licensed, was heard by the Legislative Committee on Public Health.

Assistant Corporation Counsel H. Murray Pakulski urged the passage of the measure, and declared there were many bad types of fixtures used, which situation would be corrected if the bill became a law. He read a letter from the Health Commissioner of Boston, which said that casualties from gas are constantly occurring and urging the passage of such legislation.

Building Commissioner John H. Mahoney said that deaths from gas are reported every day, and Mayor Curley is much disturbed over the situation. The proposed bill, he said, would regulate the use of fixtures all over the State.

A. E. Pillsbury opposed the bill. He said that many deaths from gas are suicidal, and that in other cases they have no more connection with public health than does an automobile fatality.

Everett W. Burdett, counsel for the Massachusetts Gas and Electric Association, and Richard Stanley, for the Arkwright Club, also opposed the bill.

## C. H. Quackenbush to Manage Wilmington Gas Co.

Wilmington, Del.—C. H. Quackenbush, of East St. Louis, has been appointed manager of the Wilmington Gas Company. He was formerly manager of St. Clair County Gas and Electric Company, at East St. Louis, Ill., supplying gas service to Edwardsville, Collinsville and East St. Louis, as well as gas and electric service in Belville, Ill. He has been in the gas business for the past 22 years, having been connected with the Merion Gas Company, Ardmore, Pa.; Kansas City Gas Company, Kansas City, Mo.; Sag Harbor Lighting Company, Sag Harbor, L. I., and the Merion and Radnor Gas ad Electric Company, Ardmore, Pa. His education and experience in the gas business has been in all departments, which makes him thoroughly conversant with all the details necessary for properly conducting the affairs of the business here. He has been an officer of both the East St. Louis Association of Commerce and the East Side Employers' Association, as well as the Illinois Gas Association. Mr. Quackenbush is married, but has no children. He will take up his residence in this city as soon as suitable quarters are available.

H. S. Schutt, who has been connected with the local company, will remain a resident of Wilmington and will still be connected with the company in an executive capacity, the details of the operation having been turned over to Mr. Quackenbush. Mr. Schutt will commute between Wilmington and Philadelphia, as he has been doing for several years, to his present office at 215 South Broad Street, where the affairs of the number of gas and water companies, of which he is an officer, are conducted. Mr. Schutt is vice-president of the C. H. Geist Company, which operates all of the utility properties owned and controlled by the Geist interests.

It is understood that there will be no change in the policy or organization of the company. It has been generally conceded by utility operators and engineers that the Wilmington Gas Company is second to none in the kind of service rendered and general management of its affairs. The company has been operated by the present owners for the past 14 years and an enormous development in its business has taken place during this period, the gas sales having been more than trebled. Approximately one and one-quarter million dollars have been invested by the consumers using its product in gas burning appliances during this period.

## Stone & Webster Add to Properties

Stone & Webster, Inc., of Boston, have added another company to the group of utilities under their management through the purchase of the Washington Coast Utilities by the Puget Sound Power & Light Company, of Seattle, the latter company having been under the management of the Boston firm for over twenty years.

The newly acquired company, besides supplying electric light and power service in several towns, does the gas business in Wenatchee, the center of the famous apple raising district in central Washington, and in Port Townsend, in the Puget Sound District. R. U. Muffley and J. M. Wilmot have been appointed, respectively, manager and assistant treasurer of the company, and H. P. Geisler, of the Puget Sound Company, will act in a consulting capacity with regard to gas properties.

## F. L. Hunt Elected Vice-Pres.

Greenfield, Mass. — F. L. Hunt, chief engineer of the Turners Falls Power & Light Company, was elected vice-president of the Western Massachusetts Engineering Society at its meeting and dinner at the Highland Hotel. Mr. Hunt takes the place of E. E. Lochridge, who was recently elected president of the society. A. L. Bausman, of the National Equipment Company, was elected to fill the vacancy caused by the promotion of Mr. Hunt. The members were addressed by Edwin H. Sniffen, manager of the power department of the Pittsburgh, Pa., branch of the Westinghouse Company. Mr. Sniffen took for his topic "The Engineer." Mr. Sniffen is responsible for the development of the 1,000,000 horsepower resources in the United States.

## Gas Company Wins in Valuation Suit

Mobile, Ala.—S. H. Dent, Jr., special master in the investigation of the case of the Mobile Gas Company and Alabama Public Service Commission, involving the petition of the company for an injunction preventing a reduction in rates, has denied the application of the Public Service Commission for an examination of the company's books. The special master held that the examination would be unfair.

The Mobile Gas Company applied to the circuit court of Montgomery County for an injunction preventing the Alabama Public Service Commission from enforcing its order for a valuation of $1,700,000 placed on its property on rehearing. The company contends that the commission had no authority to revalue the property after a tentative valuation had been established and the company's protest had been withdrawn.

## Held Annual Meeting

At the annual meeting of the Hartford City Gas Light Company, of Hartford, Conn., held January 15, the following directors were elected: Judge E. B. Bennett, Francis R. Cooley, John T. Robinson, Morgan G. Bulkeley, Jr., Frank C. Sumner, Philip Roberts, Clifford D. Cheney, Charles D. Rice. The old officers were re-elected as follows: President, E. B. Cooley; vice-president, Francis R. Eysenback; secretary and treasurer, John A. McArthur; general manager, E. F. Bennett. The company reported a successful year in 1922.